



FiTOUT[®]

Core & Functional Fitness Certification



2nd Edition

Primary Core and Functional Fitness Certification Course

Fitness Performance and Active Older Adults



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*** Certification:** We encourage registrants to study the material, complete the chapter review worksheets, and prepare to take the examination within 90 days of registration. You have **one full year from date of purchase to access the Certification Exam**.

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*** Certification Timed Exam** When you have completed the study materials and are prepared to take the **online exam**, log into your *Fitour®* account, click on “Exam Center” and choose the correct exam. This is a **timed 3 hour exam** that you must complete within the timed 3 hours. You cannot start and stop the exam. Link to the *FiTOUR®* Online Exam User Guide: <https://www.fitour.com/inhome-cert-user-guide>

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Introduction to Core & Functional Training

Including Core & Functional Training exercises and concepts into personal training and group exercise programs can provide the client with improved fitness performance and more efficient performance during activities of daily living.

The FiTOUR® Primary Core & Functional Training Certification Program is complete with tools and information which will be useful in training clients who are athletes or active older adults. Part I of this manual contains information on Fitness Performance Training to improve skill, strength and flexibility. Part II of this manual contains information on using Core and Functional Training for Active Older Adults to improve quality of life.

What is Core Training?

- Conditioning of the torso with exercises that bridge the gap between upper and lower body strength.
- Developing stabilization and balance through the center of the body establishing a foundation for performance with power and precision.
- Exercises which focus on the core muscles
- The “Core” consists of many different muscles that stabilize the spine and pelvis and run the entire length of the torso. The muscles stabilize the spine, pelvis, and shoulder and provide a solid foundation for movement in the extremities.
- The muscles of the core make it possible to stand upright and move on both feet. The muscles of the core help control movements, transfer energy, shift body weight, and move in any direction.
- A strong core distributes the stresses of weight bearing and protects the back.

What Muscles compose the “Core”?

- Rectus Abdominus
- Erector Spinae
- Multifidus
- External Obliques
- Internal Obliques
- Transverse Abdominus
- Hip Flexors:
 - Psoas Major
 - Iliacus
 - Rectus Femoris
 - Pectineus
 - Sartorius
- Gluteus Medius & Gluteus Minimus
- Gluteus Maximus
- Hamstrings
- Piriformis
- Hip Adductors & Hip Abductors

Introduction to Core & Functional Training

What is Functional Fitness Training?

- Training the body to move efficiently during all movement which may relate to athletic/physical activity or activities of daily living.
- Incorporates balance and proprioceptive input (internal sensory feedback about position and movement).
- Focuses on multi-joint movement which integrate muscle groups into very functional movement patterns.
- Uses a variety of techniques to improve speed, agility, strength, power, and overall physical performance.
- Teaches how to handle own body weight in all planes of movement.
- Develops ability to display strength in conditions of instability.
- Develops movement, not muscles by enhancing the coordinated working relationship between the nervous and muscular systems. Exercises which isolate joints and muscles are training muscles, not movements which results in less functional improvement. The brain, which controls muscular movement, thinks in terms of whole motions, not individual muscles.
- **Functional Movements:**
 - Kinetic Chain Concept: Interrelated groups of joints or muscles working together to perform movements.
 - Open Chain Movement: The foot is **not** in contact with the floor. An exercise is being performed typically with the muscle in an isolated position on a machine. Typically these movements are single jointed and are non-functional.
 - Closed Chain Movement: The foot **is** in contact with the floor or a surface in order to close the chain and simulate a movement that is performed in real life situation or sport.
- Exercises performed on traditional machines tend to be on the low end of functional training because they isolate muscles in a stabilized and controlled range of motion. While not the best way to transfer performance from the weight room to the real world, it is still recommended that such exercises still be included as part of the training program. E.g. Open Chain movement exercises can strengthen a “weak link” that a person may have thus restoring muscle balance as well as allow an individual to more safely and effectively participate in functional training activities and reduce the risk of injury.

- **Benefits of Core and Functional Fitness Training**
 - Improved Speed and Agility
 - Improved Functional Strength and Flexibility
 - Improved Coordination, Balance, and Proprioception
 - Improved Core Strength
 - Enhanced Physical Performance or Sports Performance
 - Elevated Metabolism
 - Increased Energy Levels
 - More efficient movement which can result in reduction of risk of injury during sports/fitness activities and activities of daily living



Components of Functional Fitness Performance

Before developing the components of fitness performance, FiTOUR® recommends an initial 6-week basic fitness program designed to develop and improve the 5 Components of Fitness (cardiorespiratory fitness, muscular strength, muscular endurance, flexibility, and body composition). Once an individual has developed a foundational fitness level, he/she can then transition to a more functional type of training that develops fitness performance.

The 5 Components of Fitness Performance include agility, speed, power, reaction time, and skill. An even more complete list of Components of Fitness Performance includes functional strength, functional flexibility, muscle coordination, muscle balance, and postural alignment.

- **Agility:** The ability to start, stop, and move the body quickly in different directions.
- **Speed (Velocity):** The ability to move the body quickly.
- **Power:** The ability to exert muscular strength quickly. (Speed X Force = Power).
*Force is any push or pull that causes movement.
- **Reaction Time (RT):** The ability to respond quickly to stimuli. *The elapsed time between the presentation of a sensory stimuli and the subsequent behavioral response. When the body or brain is stimulated, the stimuli is registered in the brain. The part of the brain at which the stimuli is registered sends a message to another part of your brain that controls the muscles. The brain then sends a signal to the muscles, telling them to react. Signals travel fast along each of the nerve pathways required, however the majority of the reaction time is taken up at the junction points in between the different nerves involved, and between the nerves and the muscles at the moving muscles.
 - RT is fastest when there is only one possible response (simple reaction) and becomes slower as additional response options are added (choice RT)
 - Hick's Law: RT increases proportionally to the number of possible responses until a point at which the response time remains constant despite the increases in possible responses.
 - RT is quickest for young adults and gradually slows down with age. It can be improved with practice up to a point, and declines under conditions of fatigue and distractions.

- | | | |
|--------------------------------|---|-----------------------------|
| • Gender & Age | • Anticipation | • Length of neural pathways |
| • Stage of learning | • Experience | |
| • Psychological state | • Health | |
| • Level of fitness | • Body temperature (colder body moves slower) | |
| • Number of possible responses | • Personality (extroverts react quicker) | |
| • Time available | • Stage of alertness | |
| • Intensity of the stimuli | | |

Components of Functional Fitness Performance

- **Skill:** An ability that has been acquired by training. A task that can be performed well and reproduced on command. The difference between *Health* related fitness and *Skill* related fitness is *Health* related fitness emphasizes the efficiency of the human body whereas *Skill* related fitness is related to playing sport and is very specific.
 - Movement is controlled by the conscious brain using a collection of learned movements. With time and practice, as information feedback is received by the client (from the trainer and the client's own intuitive muscle reaction), movements will become more efficient.
 - Motor skill: A learned sequence of movements that combine to produce smooth, efficient action in order to master a particular task.
 - Gross Motor skills include but not limited to lifting ones head, rolling over, sitting up, balancing, crawling, and walking. Large muscles develop before smaller ones so that gross motor development is the foundation for developing skills in other areas.
 - Fine Motor skills include the ability to manipulate small objects, transfer objects from hand to hand, and various hand-eye coordination tasks. Smaller muscle groups are recruited for activities such as a pincer grasp (thumb & forefinger) to pick up small objects, cutting, coloring, writing, or threading.
 - Types of Skills: Although there are different types of skills including cognitive and perceptual, the types of skills addressed in this manual are motor and motor perceptual.
 - Motor Skill - Movement and muscle control
 - Motor Perceptual - Involves thought, interpretation, and movement skills
 - Methods of Teaching a Skill:
 - Video
 - Verbal Instructions
 - Demonstration
 - Photo Sequences
 - Diagrams
 - Technique Drills - Appropriate drills should be identified for each client to improve specific aspects of technique or to correct faults. Drills should be selected to produce a specific effect.

- **Functional Strength:** Training the body to perform efficient movement during daily activities
 - Categories of Functional Strength
 1. Lifting: Picking up one's children
 2. Reaching: Grabbing a shirt that is folded on the top shelf of the closet
 3. Balancing: Standing on a chair as one changes a light bulb
 4. Power: Walking up hill
 5. Combinations of the Above
 - Can be thought of in terms of a movement continuum. We perform a wide range of movement activities, such as walking, jogging, running, sprinting, jumping, lifting, pushing, pulling, bending, twisting, turning, standing, starting, stopping, climbing, and lunging. With all of the activities involve smooth, rhythmic motions in the sagittal, frontal, and transverse planes.

Performing Functional Strength exercises on an unstable surface requires the body to work "as a whole" in a three-dimensional space which relates more specifically to daily activities than exercising on selectorized weight equipment.

 - Functional training should be implemented as a supplement to traditional strength training, not as a replacement.
- **Functional Flexibility:** The ability of the individual parts of the skeleton to easily, freely, and fluidly float through full range of motion without discomfort or pain.
 - Over-stretching tendons and hyper-loosening joints isn't necessary for achieving functional flexibility
 - Multi-joint activities are optimal choices to improve functional flexibility

Functional Flexibility Exercises challenge the whole body to maneuver in three-dimensional space rather than stretching in one linear plane of movement.

 1. Stability Ball Stretches
 2. Flexing and Releasing Muscles with Exercise Tubing or Band
 3. Flexing and Releasing Muscles with the assistance of a towel or strap
 4. Pilates full range of motion types of movements

- **Muscle Coordination** :The ability to use the senses and body parts in order to perform motor tasks smoothly and accurately.
 - **Coordination** is the capacity to move through a complex set of movements. Level of coordination depends on the interaction of multiple body organs and systems including the eyes, ears, brain and nervous system, cardiovascular system, and muscles.
- **Muscle Balance/Imbalances**: The relationship between the “tone” or strength and length of the muscles around a joint. There are two types of muscles:
 - *Mobilizers*: The mobilizers are found close to the body's surface and tend to cross two joints. They are typically made up of fast twitch fibers that produce power but lack endurance. With time and use they tend to tighten and shorten. Mobilizers assist rapid or ballistic movement and produce high force.
 - *Stabilizers*: Stabilizers are situated deeper, invariably only cross one joint and are made up of slow twitch fibers for endurance. They tend to become weak and long over time. Functionally, the stabilizers assist postural holding and work against gravity.

Imbalance:

While initially both groups of muscles work in a complementary fashion to stabilize and move, over time the mobilizers can inhibit the action of the stabilizers and begin to move and attempt to stabilize on their own. This inhibition of the stabilizers and preferential recruitment of the mobilizers is central to the development of "imbalance" . Core and Functional Training can help to reverse the state of “Imbalance”.

Two Types of Balance:

1. **Dynamic Balance** - The type of balance in movement in which there is a loss and regaining of balance. Example is walking.
 2. **Static Balance** - The type of balance with little or no movement and is maintained under unfavorable conditions. Example is standing on one foot on a balancing disc.
- **Postural Alignment** The position of the body; the situation or disposition of the several parts of the body with respect to each other or for a particular purpose.
 - Optimal posture and alignment help to provide good shock absorption, assist in weight acceptance, and promote the transfer of energy during movement.
 - Optimal posture allows the body to move more efficiently, fatigue less easily, and place less stress on the joints.
 - Optimal posture will assist in the prevention of overtraining, muscle imbalances, and decreased performance.
 - Posture helps determine which muscles are strong and weak by lengthening or shortening certain muscles.

Postural Misalignments: Muscle imbalances can be determined by assessing posture.

Some muscle imbalances may be seen by the “naked eye” by using gridded wall charts and examining body alignment and posture in the sagittal and frontal planes. Examining the body as a side profile (frontal plane) the ears should fall in a straight line with the shoulders-shoulders to hips– hips to knees-knees to heels/ankles. Examining the body as face forward (sagittal plane) the right & left shoulders should fall in a straight line;right hip to left hip, right knee to left knee; looking for internal or external rotation in the hip; pronation or supination in the feet. The body should be perfectly aligned as in the anatomical position.

Be mindful of functional misalignments (misalignments caused by muscle imbalance) and structural misalignments (scoliosis, osteoarthritis of the spine, fused vertebrae, replaced joints) Structural misalignments can not be changed with stretching and/or exercise.

- **Hyperlordosis or Swayback** Extreme arch in the lower back area of the body. This condition is an indication that the muscles of the back are tight and the abdominals are weak.

Correction: To help correct this misalignment, one should focus on stretching the back muscles and strengthening the abdominals.

- **Kyphosis** Convex curvature of the spine which results in the shoulders rounding forward and the buttocks tucking under. This condition is an indication that the upper back is weak and the chest is tight.

Correction: Perform exercises to stretch the chest and strengthen the upper back muscles.

- **Flat Back** The spine is completely straight with no normal curvature.

Correction: Perform functional core and lower back exercises.

- **Supination** The feet roll outward causing pain in joints and shins.

Correction: When exercising, wear cushioned, neutral shoes that have no motion control.

- **Pronation** The feet roll inward (flat feet) and the knees tend to collapse inward. This rolling inward is an indication of tight posterior muscles and the iliotibial band.

Correction: Use orthotics in the shoes and stretch tight hamstrings and gastrocnemius muscles along with the outer hip muscles.

- **Hyperextended Knees** A condition where the ligaments and connective tissues around the knee are too loose. The back tends to sway as well causing tight back muscles and weak abdominal muscles. When assessing hyperextended knees in the mirror, the leg looks as though it bends backwards.

Correction: Strengthen the knee joints by performing leg extensions and isometric yoga-type exercises.



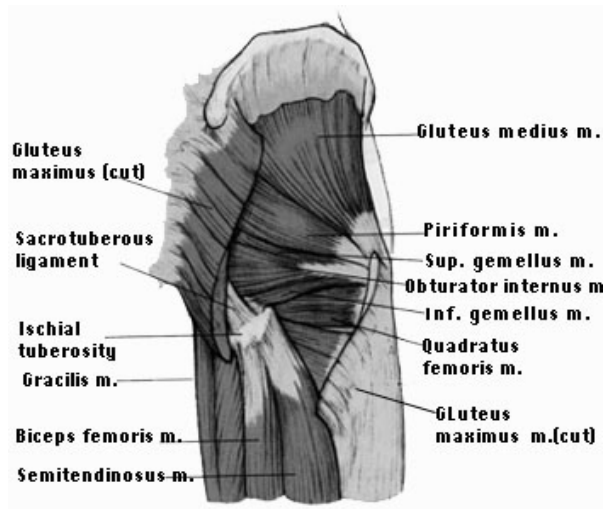
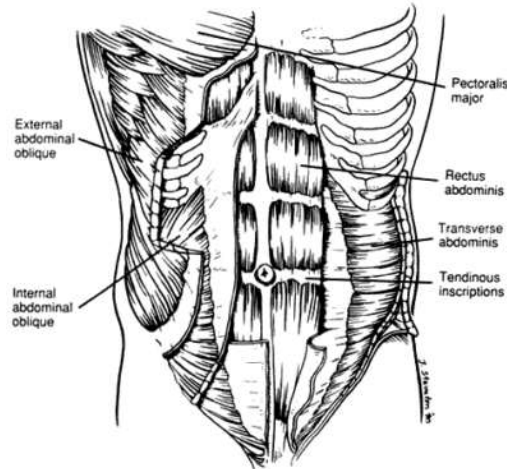
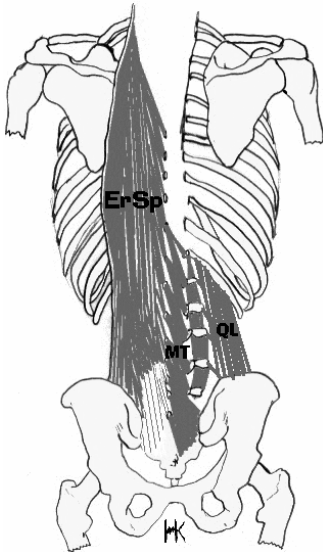
REVIEW #1

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. **Explain how Core & Functional Training will improve your students'/clients' performance of activities of daily living and sports/fitness.**
2. **Be able to describe Core Training and understand the musculature involved and the training outcomes from participating in Core Training.**
3. **List the muscles that compose the "Core" and be able to explain where the muscles are located on the body.**
4. **Be able to explain Functional Fitness Training and how your clients/students will benefit by participating in a fitness program which incorporates Functional Fitness Training.**
5. **List and be familiar with the Benefits of Core and Functional Fitness Training.**
6. **What are the Five Components of Fitness Performance?**
7. **Define & explain (a) Motor Skill; and (b) Motor Perceptual Skill.**
8. **Explain and describe Functional Strength and give examples of how it can translate into activities of daily living.**
9. **List examples of exercises that will elicit Functional Flexibility during a training session.**
10. **Explain each postural misalignment and explain how to correct and improve through strength and flexibility exercises: (a) Hyperlordosis; (b) Kyphosis; and (c) Flatback.**

• THE CORE MUSCLES

- **Lower Back** (Erector Spinae, Quadratus Lumborum, Multifidus Lumbor)
- **Rectus Abdominis**
- **Transverse Abdominis**
- **Obliques** (External/Internal)
- **Glutes** (Gluteus Maximus/Medius/Minimus)



• Functions of the Core Muscles

- Stabilize a body segment so that another body segment can generate power.
- Shock absorption
- Maintain functional postures
- Dynamic motion
 - Lateral Flexion
 - Rotation
 - Flexion

MUSCLE CONTRACTIONS

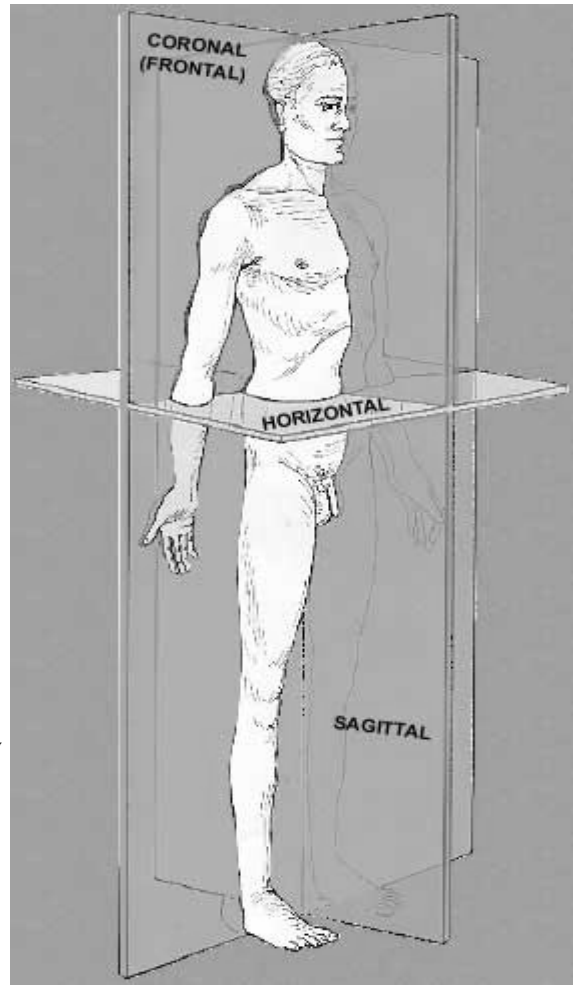
- Muscle Contraction: Muscles apply force by contracting and pulling on bones.
 - Isotonic Contraction: A muscle contraction in which the force of the muscle is greater than the resistance, resulting in joint movement with shortening of the muscle.
 - Concentric Phase: A shortening of the muscle as a result of its contraction.
 - Eccentric Phase: A lengthening of the muscle during its contraction; resists movement caused by another force
 - Isometric Contraction: A muscle contraction in which the muscle length is unchanged.
 - Isokinetic Contraction: A muscle contraction with controlled speed, allowing maximal force to be applied throughout the range of motion.

MUSCLE FIBER TYPES

- There are 3 different types of muscle fibers
 - Type I Slow-Oxidative (SO)
 - Also known as Slow-Twitch Fiber
 - Speed of Contraction: Slow
 - Force: Low
 - Resistance to Fatigue: High
 - Recruited during endurance type activities
 - Type IIa Fast Oxidative Glycolytic (FOG)
 - Also known as Intermediate Fiber
 - Speed of Contraction: Fast
 - Force: High
 - Resistance to Fatigue: High
 - These muscle fibers can be trained to act as either Type I or Type IIb
 - Type IIb Fast Glycolytic (FG)
 - Also known as Fast-Twitch Fiber
 - Speed of Contraction: Fast
 - Force: High
 - Resistance to Fatigue: Low
 - Recruited during power/explosive type activities.

Kinesiology/Biomechanics

- **Kinesiology:** the scientific study of human movement.
- **Anatomical position:** The universally accepted reference position used to describe regions and spatial relationships of the human body and to make reference to body positions.
- **Planes of Motion:** Flat imaginary surfaces that divide the body into halves in order to correspond with movement, motion, and actions. Human movement occurs in a plane.
 - **Median/Sagittal Plane:** A vertical plane that passes through the body anterior to posterior dividing the body into right and left sections. Flexion and extension actions occur within the sagittal plane.
 - **Frontal/Coronal Plane:** A vertical plane that passes through the body from side to side dividing the body into anterior and posterior sections. Abduction and adduction actions occur within the frontal plane.
 - **Transverse/Horizontal Plane:** A horizontal plane that passes through the body dividing the body into superior and inferior sections. Rotation and twisting actions occur within the transverse/horizontal plane.
 - **Oblique Plane:** A plane that lies tilted among the 3 primary planes associated with kinesiology.



*Movement within a plane will always occur parallel to that plane.

- **Muscle Movement/Action Categories**
 - **Prime Movers (Agonist):** Muscles responsible for a definite movement of a joint.
 - **Antagonist:** Muscles that cause movement at a joint in a direction opposite to that of its agonist.
 - **Synergists:** Muscles that keep the joint steady while assisting the agonist in performing a joint action



REVIEW #2

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. **Explain an Isotonic Muscle Contraction and give examples of two exercises that elicit Isotonic Muscle Contractions.**
2. **Provide an example of an Isometric Muscle Contraction and explain how an Isometric Muscle Contraction is different from an Isotonic Muscle Contraction.**
3. **Describe what type(s) of exercises would need to be performed to elicit Isotonic Muscle Contractions during a training session.**
4. **Be able to list and explain in detail the three different types of muscle fibers and how understanding the muscle fiber types will assist you in training your client/student.**
5. **What is Kinesiology?**
6. **Explain movement in the Sagittal Plane and list 3 exercises that are performed in the Sagittal Plane.**
7. **Explain movement in the Frontal Plane and list 3 exercises that are performed in the Frontal Plane.**
8. **Explain movement in the Transverse/Horizontal Plane and list 3 exercises that are performed in the Transverse/Horizontal Plane.**
9. **Does movement in a Plane occur horizontally or parallel to that specific Plane?**
10. **List and understand the three categories of Muscle Movement/Action. Explain the role of each when performing a Bicep Curl exercise.**

SAFETY & GUIDELINES

For Core & Functional Training

- **Core & Functional Training Guidelines**

- Frequency: 2-4 days per week
- Intensity: With control
- Time:
 - Isotonic Contraction Exercises: 20 reps 1-2 sets
 - Isometric Contraction Exercises: hold position for approximately 30 seconds (up to 3 sets)

- **Core/Functional Fitness Equipment Safety**

- Do not bounce the equipment if bending or twisting.
- Do not use equipment on slippery surfaces.
- Inspect the equipment for damage. Replace if damaged.
- Perform all exercises slowly with control and proper form.
- Wear proper footwear.
- Workout in an open space.
- Don't use heavy weights while training on equipment.
- When using stability and medicine balls, use the correct ball size for your height and weight.
- Make sure there are no sharp objects on the floor.
- Avoid prolonged exposure of equipment to sunlight or water.
- Keep the equipment away from sources of heat.
- Consult physician before beginning an exercise program.
- Keep the equipment away from young children.
- Wear proper clothes to allow for full range of motion.
- Avoid wearing jewelry while using equipment.
- Well manicured nails; long fingernails should be trimmed. Risk of injury (e.g. flipped back nail) increases with tossing/catching exercises.

FiTOUR® Core & Functional Training Certification
Volume 2

PART I

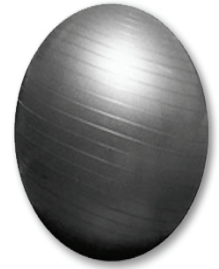
Fitness Performance

**A Comprehensive Guide to Assessment, Development and Implementation
of Core & Functional Training Concepts for Fitness & Sports Performance
for Personal Fitness Trainers and Group Exercise Instructors**



Core and Functional Training Equipment for Athletic Fitness/Sport Conditioning

The idea behind using equipment for Core and Functional Training is to provide an unstable environment to elicit recruitment of deep muscle fibers and core muscles in order to stabilize the body during execution of the exercises. Equipment will also encourage development of neuromuscular proprioception which will result in improved movement and functionality in everyday activity and sports.



- **Stability Ball:** Practical Piece of Equipment
 - Takes up little space when deflated
 - Easily transported
 - When inflated, can take the place of a chair, the floor, or a weight bench
 - The stability ball is an aid in performing various exercises that can only be done on the ball.
 - Only use antiburst or slow air release stability balls
 - Keep stability balls away from heat and/or sharp objects
 - When using a stability ball, be aware of floor surface (avoid sliding, uneven surfaces, rough surfaces e.g. graded concrete, or surfaces with a sharp edge e.g. gravel)
Always inspect equipment for damage prior to usage.

- **Size and Inflation**

- **Size**

- When sitting on the ball, the upper legs should be parallel to the floor and the knees at 90°

HEIGHT	BALL SIZE
5'-5'7	55 cm
5'8-6'2	65 cm
6'3-6'9	75 cm
Over 6'9	85 cm

- **Inflation**

- Inflate with bicycle pump, air mattress pump, air compressor or lungs.
 - Wall-Marker Test: Mark a line on the wall at the specific height at which you want the ball inflated (ex., 65 cm). Then inflate the ball with a ruler leveled on top of the ball. When the ruler/ball reaches the line on the wall, then the ball is at the correct height.
 - Touch Test: Finger can press in the ball about 1-2 inches

- **Skill Level**

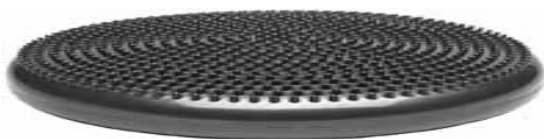
- Beginner: Inflate the ball less to make it more stable
 - Advanced: Inflate the ball more to make it more “lively”

Medicine Ball: Exercises performed with a medicine ball assist in bridging the gap between conventional strength and endurance exercises. Medicine ball exercises are “plyometrics for the core” and teach the summation of force from the ground through the legs, through the core and out through the arms.

BODY WEIGHT	BALL WEIGHT (Rotation)	BALL WEIGHT (Overhead)
100-135 lb	1 kg	1 kg
135-175 lb	2 kg	2 kg
175-200 lb	3 kg	2 kg
200-250 lb	4 kg	3 kg



Balance Disks: A rubber-like inflatable disk that is used to direct one’s proprioceptive reactions. Can be substituted for Bosu.



BoSU®: On the BoSU® Balance Trainer the abs work functionally in standing, kneeling, seated, side-lying, prone and supine positions and can be challenged with traditional isolation or stabilization exercises where the goal of the exercise is to maintain a neutral and otherwise, properly aligned spine.



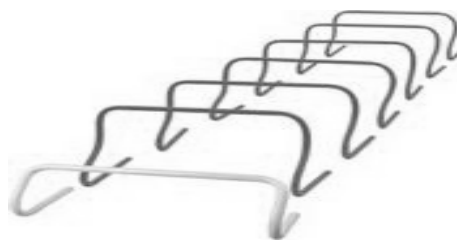
Agility Ladder: Agility ladders are used for improving coordination, foot agility, foot speed, and balance. The slats can be adjustable so you can space them as desired.



Cones: Used during agility and speed drills.



Hurdles: Hurdles are used during plyometric, speed, and agility drills.



Step(s): Used at different heights during plyometric exercises.

Always inspect equipment for damage prior to usage.



REVIEW #3

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. According to the Training Guidelines, Core & Functional Training should be performed _____ days per week.
2. Review the Equipment Safety Guidelines and explain what steps should be taken in the following scenarios: (a) Slippery floor; (b) Staples on the floor; (c) Stability Balls stored near space heater; and (d) Zippers on pants or jacket when using Stability Ball.
3. Understand and explain how the use of stability equipment will provide your clients with training effects that will improve movement and function in sports and daily activities.
4. What is the best way to determine the proper size Stability Ball for a client/student?
5. Explain why a Stability Ball that has less air is best for beginners.
6. Understand and explain the benefits of training with a Medicine Ball.
7. What types of Drills can be performed using Cones?
8. What types of Drills can be performed using Hurdles?
9. Explain the benefits of using an Agility Ladder.
10. What piece of equipment can be used in place of a BOSU® to train proprioceptive reactions?

Primary Core and Functional Fitness Program Design

• Warm-Up

- Introduction To Core and Functional Fitness: 5-10 minutes prior to class or session
 - Explanation of the Different Equipment
 - Explain Proper Technique
 - Explain Exercise Modification Options
 - Explain Safety Issues
- Purpose: Prepares the body for vigorous exercise and may reduce the risk of injury.
 - Time: 5-10 Minutes
 - General Guidelines: Perform exercises that warm-up the entire body with focus on the spine. The warm-up should be sufficient to increase the body's core temperature and should utilize movements that are performed in the same plane and incorporate the muscle groups to be targeted during the Workout.
 - Exercises should be Linear and Lateral. Choose warm-up exercises that are specific to the type of training which will be performed during the session.
 - Linear Movements in the Sagittal Plane (i.e. prepare the body for running drills)
 - Lateral Movements in the Frontal Plane (i.e. prepare the body for lateral drills)

• Workout

- Purpose: The purpose for core and functional training is to train with purpose developing agility, speed, power, reaction time, skill, core and functional strength. Each class or session should incorporate exercises that condition all major muscle groups of the body with particular attention to the core.
- Time:
 - Beginner: 20-25 Minutes
 - Intermediate: 35-40 Minutes
- Guidelines:
 - Start slowly and gradually increase the intensity.
 - Review the sections on developing agility, speed, power, reaction time, and skill.
 - Review the sections on developing core and functional strength.
 - Review the Progression Chart.
 - If performing agility, speed, plyometrics, and core training within one training session follow the below format:
 - First: Core Training
 - Second: Plyometrics
 - Third: Agility and Speed

- **Cool Down**

- Purpose: To provide a transition between vigorous activity and less vigorous or intense exercise. This time allows the working heart rate to decrease and return to pre-exercise rate. It also helps participants to flush the lactate out of the muscles and decrease muscle soreness.
- Time: 2-5 Minutes
 - Guidelines:
 - Transition from more intense exercises to less intense exercises. Cooling down also includes re-hydrating with water, a sports drink, or electrolyte solution to replenish fluids, carbohydrates and electrolytes.
 - Example: If performing speed work, after sprinting, walk to cool down.

- **Slow Stretch**

- Purpose: Flexibility is as significant as strength and cardio. If range of motion is limited due to inflexibility, potential physiological benefits may be reduced. The post workout stretches improve posture and performance. Stretching alleviates stiffness, maintains joint integrity and prevents low back pain and other injuries. Performing a series of slow stretches is a relaxing way to finish up the workout and increase feelings of well-being.
- Time: 5 Minutes
- Guidelines: Appropriate static stretches may include calves, quadriceps, hamstrings, hip flexors, low back, upper back, shoulders, biceps, triceps, and neck. Encourage your participants to practice the slow stretches outside of class as well. A slow, continuous stretch is desired. Exhale as you move into each position. Hold the limits of joint motion until there is tension in the muscle, then relax into the stretch for 15 to 30 seconds
 - Do's
 - Maintain a lengthened and neutral spine.
 - Lead with the chest not the head when hinging forward from the hips as in a hamstring stretch.
 - Stop the stretch with loss of form.
 - Stretch when the muscles are warm.
 - Breathe from the diaphragm throughout the entire stretching routine.
 - Don'ts
 - Stretch to the point of pain.
 - Compete with others and exceed range of motion.
 - Bounce into the stretch.
 - Hold the breath on the stretches.
 - Rush through the stretch routine.

Music: When selecting music choose music that is appropriate for the participants. Points to consider when selecting music is skill level, how quickly participants will move, clientele (age, demographics. lyric appropriateness)

Beats Per Minute (BPM):

- Core Conditioning: Up to 130 bpm
- Sports Conditioning: Up to 132 bpm

**TRAINER'S CHECKLIST FOR PROPER CORE & FUNCTIONAL TRAINING
TECHNIQUE FOR ATHLETIC FITNESS/SPORTS PERFORMANCE**

The Checklist below is a good tool for a trainer to use to instruct client in proper technique.

✓	Legs and Lower Body	Observation
		When sitting, standing, or lying supine on stability equipment, are the feet balanced distance apart?
		When sitting, standing, or lying supine on stability equipment, are the knees at 90 degrees?
		When squatting, do the knees remain behind the toes?
		Depending on the exercise, is there undue pressure on the knees?
		Are the legs and lower body doing the work or is there another body part compensating?
		Are the hips stable or moving side to side?
	Upper Body	Observation
		Is pelvis neutral?
		Is spine straight?
		Are the shoulders relaxed?
		Are the abdominal muscles engaged?
		Is face relaxed, calm, and smiling, or strained?
		Are hands in the right position during the exercise?
	Other	Observation
		Are students drinking water regularly?
		Are students "getting into" the exercises?
		Is the vast majority of the group staying up with the class?
		Are people burning out on a particular movement, position, song?
		Do students need a breather?
		Are students cohesive as a group, interacting with one another, and enjoying the activity as a whole?
		Is there a team spirit and sense of working towards a goal as a group made up of individuals, progressing through time and improving?



REVIEW #4

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. **When initiating Beginners into a Core and Functional Fitness Training Program, how much time is recommended to devote to explanation of equipment, proper technique, exercise modification options and safety issues?**
2. **Describe the activities/exercises that should be utilized during the Warm-Up portion of a Core & Functional Training session and why the Warm-Up exercises should be specific to the type of training that will be performed during the training session.**
3. **How long should the Warm-Up and Workout portions of a Core & Functional Training session be for the (a) Beginner; and (b) Intermediate?**
4. **Explain (a) purpose of the Cool Down portion of a Core & Functional Training program, (b) the length of time that should be devoted and (c) what type of activities should be utilized during the Cool Down portion of the training session.**
5. **Explain the importance of incorporating a Slow Stretch and be familiar with the Guidelines for performing stretching at the end of a Core & Functional Training session.**
6. **What is the suggested BPM for music when performing (a) Core Conditioning; and (b) Sports Conditioning.**
7. **Review the Trainer's Checklist for Core & Functional Training and be familiar with how to correct students'/clients' alignment and posture.**

Assessment of Core & Functional Strength

For more comprehensive Assessment Tools for Functional Strength and Flexibility, Muscle Coordination, Muscle Balance/Imbalance, Postural Alignment, Agility, Speed, Power and Reaction Time, we recommend the FiTOUR® Advanced Personal Trainer Program

Core & Functional Training vs. Sport Specific Training

Core and Functional Fitness training is not “sport specific” training.

Core and Functional Fitness training, although it looks very similar to “sport specific” training, focuses on the movement type of the activity and develops the foundation within the body to perform that movement.

Analyzing Activity

To properly assess a client’s current level of core and functional fitness level, an instructor or personal trainer needs to analyze the client’s activity or sport. It is important that the trainer analyze body mechanics required to perform an activity or sport efficiently.

When analyzing the body mechanics used in an activity, one should ask a few questions:

1. Is the activity or sport explosive in nature? Many sports require that the person’s body recruit fast twitch fibers in order to perform the movement required within that sport. One should train accordingly with explosive plyometrics.
2. Is the activity or sport quick and intermittent in nature? Many sports or activities require that one move quickly in different directions. Tennis is a great example of intermittent and back and forth type activity. One should train accordingly with agility type exercises.
3. Is the activity long and enduring? Long distant runners need to train with endurance type training and steer away from only developing the anaerobic system.

Assessment and Development

Assessing Skill Performance: Initially, compare visual feedback from the client's movement with the technical model of the specific activity to be achieved. Clients should be encouraged to evaluate their own performance.

In assessing the performance of a client consider the following points:

- Are the basics correct ?
- Is the direction of the movement correct ?
- Is the rhythm correct ?

It is important to ask athletes to remember how it felt when correct examples of movement are demonstrated (kinesthetic feedback). Appropriate checklists/notes can be used to assist the personal trainer in the assessment of a client's technique.

Example Skill Assessment: Running - Compare a client's actual running performance with the proper running technique.

Determining Skill Inefficiencies: Having assessed the skill performance and identified that there is a deficiency, the Personal Trainer needs to determine why this is happening.

Inefficiency can be caused by :

- Incorrect understanding of the movement by the client
- Poor physical abilities
- Poor coordination of movement
- Incorrect application of power
- Lack of concentration
- Inappropriate clothing or footwear
- External factors e.g. weather conditions

Assessing Core and Functional Strength

Use the following assessments to test and rate Core Strength and Functional Strength.

- **Core Strength:** Assess client's Core Strength by using One-Minute Sit-Up Test.
 - Starting Position: Lie on a carpeted or cushioned floor with knees bent at approximately right angles, with feet flat on the ground. Hands should be resting on thighs.
 - Technique: Contract abdominal muscles, push back flat and raise high enough for hands to slide along thighs to touch the tops of knees. Don't pull head or neck. Keep lower back on the floor. Then return to the starting position. Repeat as many times for 1 minute. Find score on chart below.

CORE STRENGTH SCORING

Men Age	18-25	26-35	36-45	46-55	56-65	65+
Excellent	>49	>45	>41	>35	>31	>28
Good	44-49	40-45	35-41	29-35	25-31	22-28
Above average	39-43	35-39	30-34	25-28	21-24	19-21
Average	35-38	31-34	27-29	22-24	17-20	15-18
Below Average	31-34	29-30	23-26	18-21	13-16	11-14
Poor	25-30	22-28	17-22	13-17	9-12	7-10
Very Poor	<25	<22	<17	<9	<9	<7

Women Age	18-25	26-35	36-45	46-55	56-65	65+
Excellent	>43	>39	>33	>27	>24	>23
Good	37-43	33-39	27-33	22-27	18-24	17-23
Above average	33-36	29-32	23-26	18-21	13-17	14-16
Average	29-32	25-28	19-22	14-17	10-12	11-13
Below Average	25-28	21-24	15-18	10-13	7-9	5-10
Poor	18-24	13-20	7-14	5-9	3-6	2-4
Very Poor	<18	<20	<7	<5	<3	<2

• Upper Body Functional Strength

Push-Up Test: Men should use the standard "military style" pushup position, with the hands pointing forward and under the shoulder, back straight, head up, using the toes as the pivotal point. Women have the additional option of using the "bent knee" position. To do this, kneel on the floor, legs together, lower leg in contact with mat with ankles plantar-flexed, back straight, hands shoulder width apart, head up, using the knees as the pivotal point.

Starting in the 'down' position, do as many push ups as possible with proper form (chin touches floor as elbows flex but stomach does not touch the mat, keeping the back straight at all times, arms must push up to a straight arm position) without rest, until exhaustion. Count the total number of pushups performed.

UPPER BODY FUNCTIONAL STRENGTH SCORING

Men	Age	17-19	20-29	30-39	40-49	50-59	60-65
Excellent		>56	>47	>41	>34	>31	>30
Good		47-56	39-47	34-41	28-34	25-31	24-30
Above average		35-46	30-39	25-33	21-28	18-24	17-23
Average		19-34	17-29	13-24	11-20	9-17	6-16
Below average		11-18	10-16	8-12	6-10	5-8	3-5
Poor		4-10	4-9	2-7	1-5	1-4	1-2
Very Poor		<4	<4	<2	0	0	0

Women	Age	17-19	20-29	30-39	40-49	50-59	60-65
Excellent		>35	>36	>37	>31	>25	>23
Good		27-35	30-36	30-37	25-31	21-25	19-23
Above Average		21-27	23-29	22-30	18-24	15-20	13-18
Average		11-20	12-22	10-21	8-17	7-14	5-12
Below average		6-10	7-11	5-9	4-7	3-6	2-4
Poor		2-5	2-6	1-4	1-3	1-2	1
Very Poor		0-1	0-1	0	0	0	0

- **Lower Body Functional Strength:** To date, there is not a definitive reliable test that will measure lower body functional strength. Assumptions can be based on the performance of different types of one-leg squats, but no standards have been established (Boyle, 2004). An alternative is to measure functional lower body strength with the two-leg vertical jump to assess leg power.

- **Two-Leg Vertical Jump**

- **Description / Procedure:** the athlete stands dominant hand side to a wall and with chalk rubbed on fingertips reach up with the hand closest to the wall. Keeping the feet flat on the ground, the point of the fingertips is marked or recorded. The athlete then stands away about 6 in. from the wall, and jumps vertically as high as possible using both arms and legs to assist in projecting the body upwards. The chalked hand attempts to touch the wall at the highest point of the jump. The difference in distance between the reach height and the jump height is the score. The best of three attempts is recorded.

- **Modifications:** Other test modifications are to perform the test with no arm movement (one hand on hip, the other raised above the head) to isolate the leg muscles and reduce the effect of variations in coordination of the arm movements. The test can also be performed off one leg, with a step into the jump, or with a run-up, depending on the relevance to the sport involved.


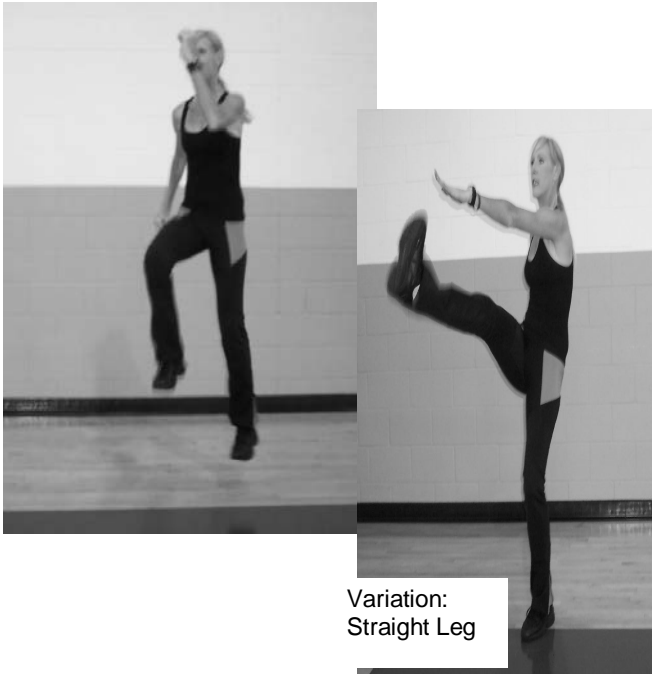
- **Scoring:** The jump height Jump is usually recorded as the score in distance. The table below provides a ranking scale for adult athletes.

- **Equipment required:** measuring tape or marked wall, chalk for marking wall.

Rating	Males (cm)	Females (cm)
excellent	> 70	> 60
very good	61-70	51-60
above average	51-60	41-50
average	41-50	31-40
below average	31-40	21-30
poor	21-30	11-20
very poor	< 21	< 11



Warm-Up Exercises

Below are exercises that would be appropriate to prepare the body for Core & Functional Training. This list is by no means complete. There are many other exercises that can be utilized for a Core & Functional Training Warm-Up..

Linear Movements	Technique	Exercise Image
<p>High Knee Walk</p> <p>Equipment Needed: None</p> <p>Perform for 5 min.</p>	<p>Walk forward with every step lift the knee as high as you can. Grab the shin of the lifted leg and pull in towards the chest. As you lift your knee extend the other leg and lift up on the toes. Lower down and grab the other shin.</p>	
<p>Skipping</p> <p>Equipment Needed: None</p> <p>5 Sets</p>	<p>Skip in slow motion landing on alternate feet. Try to achieve as much height and distance with each stride as possible. Perform for 1 minute and rest for 30-60 seconds before the next set.</p> <p>VARIATION: Straight Leg Skip</p>	 <p>Variation: Straight Leg</p>



Warm-Up Exercises

(Continued)

Linear Movements	Technique	Exercise Image
<p>Running</p> <p>Equipment Needed: None</p> <p>5 Sets</p> <p>*stay on the balls of the feet; running in place & high knee run—the chest stays tall with a slight lean back or tailbone pointing toward floor. Heel slaps—slight lean forward with chest tall to stay on balls of the feet as in running.</p>	<p>Include variations of Running.</p> <ol style="list-style-type: none"> 1. Running in Place 2. High Knee Run: Run in place or moving by lifting knees as high as possible Heel Slaps: Run by kicking the heel toward the buttocks 3. Backwards Run: Run backwards, placing emphasis on landing on the heels 	 <p>The image contains three black and white photographs of a woman demonstrating running variations. Photograph 2 shows her in a High Knee Run position, lifting her right knee high. Photograph 3 shows her in a Heel Slaps position, kicking her right heel toward her buttock. Photograph 4 shows her in a Backwards Run position, running backward with her right foot forward.</p>
<p>Walking Lunges</p> <p>Equipment Needed: None</p> <p>5 Sets</p> <p>Beginners: back knee should fall in a straight line with the hip being mindful the knee does not bang into ground. A longer stance is encouraged to elicit a stretch of the hip flexors as in plyometrics—more advanced.</p>	<p>From a standing position step out with one foot in a wide split stance. When the foot reaches the floor, bend the knees simultaneously in a lunge position. Repeat with the other leg. Continue to lunge moving forward as though walking with long steps. Hold a broomstick behind the body and ‘glue’ spine to broomstick to keep spine stacked and chest tall.</p>	 <p>The image shows a black and white photograph of a woman performing a walking lunge. She is in a split stance with one leg forward, bending both knees. She is holding a broomstick behind her back with both hands, using it to maintain a straight spine.</p>



Warm-Up Exercises

(Continued)

Lateral Movements	Technique	Exercise Image
<p>Big Step Touch</p> <p>Equipment Needed: None</p> <p>Perform for about 5 min.</p>	<p>Stand with the feet together and the knees bent sinking the hips low. Using the lower body muscles step to the side as wide as you can. Bring the trailing foot in and tap. Step back to the other side keeping the hips low and tap the trailing foot. The arms are in a natural running position. To steadily increase the intensity add a little hop, but not as big as you would in plyometric exercises.</p>	
<p>Lateral Lunge</p> <p>Equipment Needed: None</p> <p>5 Sets</p>	<p>Stand in a wide stance about 4 feet wide or as wide as you can. Place the hands behind the head with the elbows wide out to the sides. Sit to one side sitting in the back of the heels. Keep the knee behind the toes. Keep the abs engaged and the chest upright. Hold to one side for 1 second. As you shift your body weight back up to standing, press through the heel. Repeat on the other side shifting from side to side. Perform for 1 minute, rest and repeat.</p>	

Warm-Up Exercises

(Continued)

Lateral Movements	Technique	Exercise Image
<p>Lateral Running</p> <p>Equipment Needed: None</p> <p>5 Sets</p>	<p>Run while moving laterally. The variations of the Linear Running on the previous page can be utilized.</p>	
<p>Bug Push-Up</p> <p>Equipment Needed: None</p> <p>5 Sets</p> <p>Beginners: practice the runners lunge as a bent knee stance progressing to a straight leg. Be mindful of this exercise if experiencing low back issues or hip issues</p>	<p>From a push-up position, bring your right foot up and place it on the outside of the right hand. Bend your right elbow intensifying the stretch through hamstrings and glutes. Straighten your elbow and return your foot back to the push-up position. Repeat on other side. Perform for 1 minute, rest and repeat.</p>	



REVIEW #5

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. **True or False? Core & Functional Fitness Training is “Sport Specific” Training.**
2. **List and be familiar with the three questions that should be asked when analyzing body mechanics used in a specific activity.**
3. **If a sport requires the recruitment of fast twitch muscle fibers, a trainer should choose which mode of functional training to elicit a positive training response: (a) plyometrics; (b) agility; or (c) balance?**
4. **When training a client for an activity such as tennis which is quick and intermittent in nature, a trainer should choose which mode of functional training for a positive training effect: (a) plyometrics; (b) balance; or (c) agility?**
5. **When training a client for an endurance event such as a marathon, a trainer should center the training program around which type of activity to elicit a positive training effect: (a) aerobic endurance runs; or (b) interval wind sprints?**
6. **List and be familiar with the 7 factors that should be examined when determining Skill Performance deficiency.**
7. **Briefly explain how to conduct the following Assessments: (a) Core Strength; (b) Upper Body Functional Strength; and (c) Lower Body Functional Strength.**
8. **True or False? The Lower Body Functional Strength Assessment is a very definitive reliable test to measure Lower Body Strength.**

Developing Agility and Speed

The following exercises develop agility and speed.

Quality is the key ingredient for speed and agility drills to be successful. Keep the individual sprints short and rest completely between sets.

General Guidelines for Agility and Speed Drills

1. Warm up thoroughly.
2. If performing core and plyometric exercises the same day, perform them before performing sprint or agility drills.
3. Speed and agility drills should be performed on separate days from other training days.
4. One must have a strong fitness base before trying these agility and speed drills.
5. A typical session should consist of approximately 5 sets of 10 repetitions (each sprint being 1 repetition).
6. One-Two sessions a week.
7. Always mirror the movement patterns of the specific sport or fitness activity when choosing drills that develop agility and speed.
8. Allow at least 30 seconds of rest between sets.

Agility and Speed Exercises	Technique	Sets
Conventional Suicide Drill Equipment Needed: 5 Cones	Set up the cones equidistance apart in a single line. On command from the personal trainer, the client sprints to the first cone, then sprints back to the starting line. Then the client sprints to cone #2, then back to the starting line. Then the client sprints to cone #3, then back to the starting line. He/she repeats the same pattern until he/she gets to the 5th cone and back to the starting line. The client repeats this drill 9 more times.	10
Hollow Sprints Equipment Needed: 6 Cones	Place the Cones equidistance apart. Start by sprinting to cone #2 then walk to cone #3 then sprint to cone #4 then walk to cone #5 then sprint to cone #6 then walk back to cone #1 to repeat. Repeat this drill to total 5 sets.	5
Ladder Drills Equipment Needed: Ladder	The instructor or personal trainer can set up various agility drills with an agility ladder.	Varies
The Weave Equipment Needed: 6 Cones	Set up the cones in a straight line. Sprint to the last cone while weaving in and out of the cones and turn around and weave back to the start. Repeat this drill for a total of 10 sets.	10




Developing Power with Plyometric Exercises

Plyometric exercises incorporate the rapid deceleration and acceleration of muscles. Plyometric exercise refers to those activities that enable a muscle to reach maximal force in the shortest possible time. Plyometric literally means to increase measurement (plio=more; metric=to measure). In short, plyometrics are quick, powerful movements using a prestretch or countermovement that involved the stretch shortening cycle. Plyometrics are used to develop rhythm, speed, power and muscular endurance by training the muscles, connective tissue and nervous system.



General Guidelines for Plyometric Drills

1. Warm up thoroughly.
2. One—Two sessions per week. Perform on separate days from other training days. If performing speed or agility drills during the same workout, execute the plyometric exercises first.
3. Plyometrics are only appropriate for individuals who have a strong fitness base.
4. A typical session should consist of approximately 5 sets of 10 repetitions.
5. Always mirror the movement patterns of the specific activity when choosing drills.

Plyometric Exercise	Technique	Exercise Image
<p>Box Jump Equipment Needed: 8-12 inch Step Perform 5 Jumps 5 Sets Rest for 1 min between sets Proper landing technique is essential. Landings should be soft thus absorbing the forces with the shoulder over the knees through flexion of the ankles. Knees & hips. If the center of gravity is offset from the base of support, performance is hindered and injury may occur. Beginners: practice jumps in place.</p>	<p>Stand on the floor facing the box with feet about hip width apart. Jump up on top of the box while driving the knees towards the chest and immediately jump down back towards to the floor.</p> <p>NOTE: Can be performed laterally also</p>	
<p>Single Leg Hurdle Jump Equipment Needed: 6-inch hurdles Perform 5 Jumps on Each Leg for 3 sets totaling 30 Jumps Rest for 1 min between sets</p>	<p>Line up 5 hurdles in a vertical line. Begin by standing on one foot. Jump over the first hurdle and land on one foot. Stick the landing. Jump over the second hurdle using the same foot and technique and then jump over the 3rd, 4th, and 5th hurdles sticking the landing each time.</p>	
<p>Power Skater Equipment Needed: None Perform for 15-30 Seconds 5 Sets Rest for 1 min between sets</p>	<p>Begin by standing on one foot. Jump up and over laterally to the right side as far as you can landing on the other foot. Hold the landing for 1 second before jumping back to the other side.</p> <p>NOTE: Can be performed as a “Power Skater Cross Back” by crossing the drag leg behind as you land.</p>	



REVIEW #6

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. _____ is the key ingredient for speed and agility drills to be successful.
2. List and be familiar with the 8 General Guidelines for Agility and Speed Drills.
3. Explain how to set up and conduct the “Conventional Suicide Drill”.
4. Explain how Plyometric Exercises assist with performance of sports activities which require rhythm, speed and power.
5. Plyometric Exercises incorporate rapid _____ and _____ of muscles.
6. Plyometric Exercises are activities which enable a muscle to reach _____ force in the _____ possible time.
7. Plyometric Exercises are quick powerful movements using a _____ or countermovement that involves the stretch shortening cycle.
8. Plyometric Exercises are used to develop _____, speed, power and _____ endurance.
9. Plyometric Exercises should be performed a maximum of how many times per week?
10. In what order should activities be performed if using Plyometric and Agility Training in the training session?

Developing Core and Functional Strength


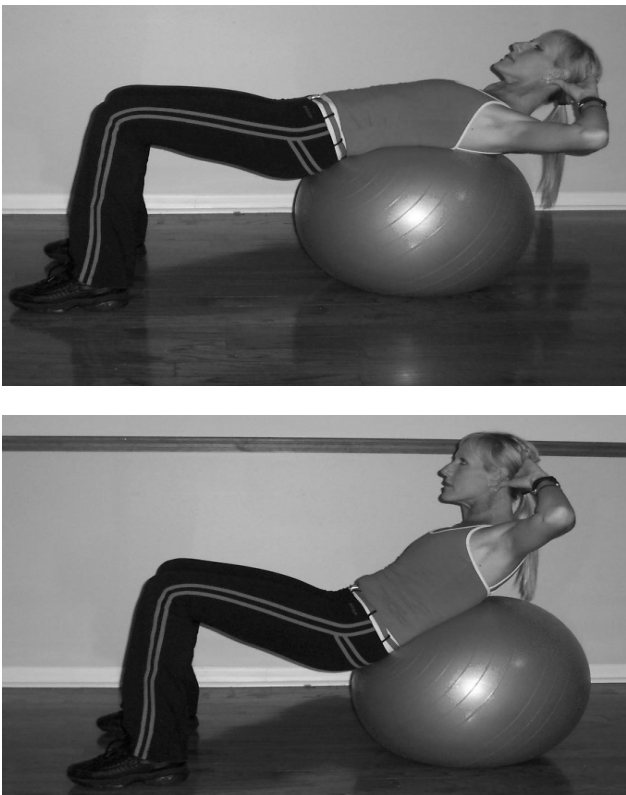
Technique and Progression



- **Core Stabilization:**
 - The use of abdominal and back muscles (anatomical girdle) to provide reinforcement and protection of the spine during lifting, sport or any other activity.
 - Achieved through a contraction of the anatomical girdle musculature. Maintain this contraction while performing core and functional strength exercises. Do not hold the breath.
- **Technique:**
 - Perform all exercises with slow, controlled movements.
 - Perform the exercises with integrity and at the appropriate fitness level.
 - Avoid using heavy weights when performing core and functional movements.
 - Set up the correct position according to the exercise before beginning the exercise.
 - Execute proper balance prior to performing any exercise
 - Perform all exercises in full range of motion.
 - Maintain neutral spine and alignment.
- **Progression:**
 - *Learn the basic exercises first.* Master the basics using only body weight before progressing to a piece of unstable equipment or adding weight.
 - *The 3-Week Progression:* Begin each exercise with body weight only during Weeks 1-3. Add weight after Week 3. Add instability after Week 6.
 - Week 1: 3 Sets of 8 Reps
 - Week 2: 3 Sets of 10 Reps
 - Week 3: 3 Sets of 12 Reps
 - Week 4-6: Add Weights
 - Week 7-9: Add Instability
 - Week 10+: Add One Arm or One Leg Exercises
 - *Progress from simple to complex.* Perform and accomplish exercises such as a basic squat before progressing to a more difficult exercise like the one-legged squat.

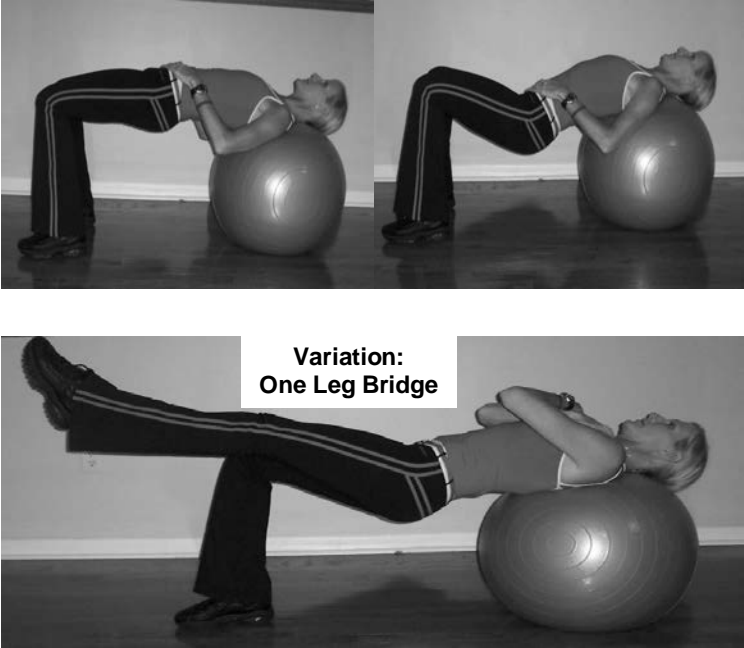

Progression Chart (suggested progression)

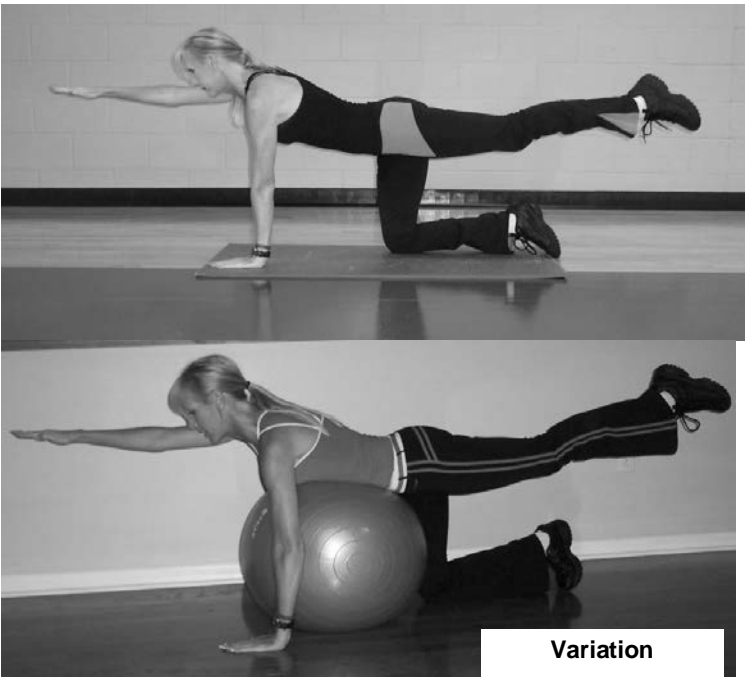
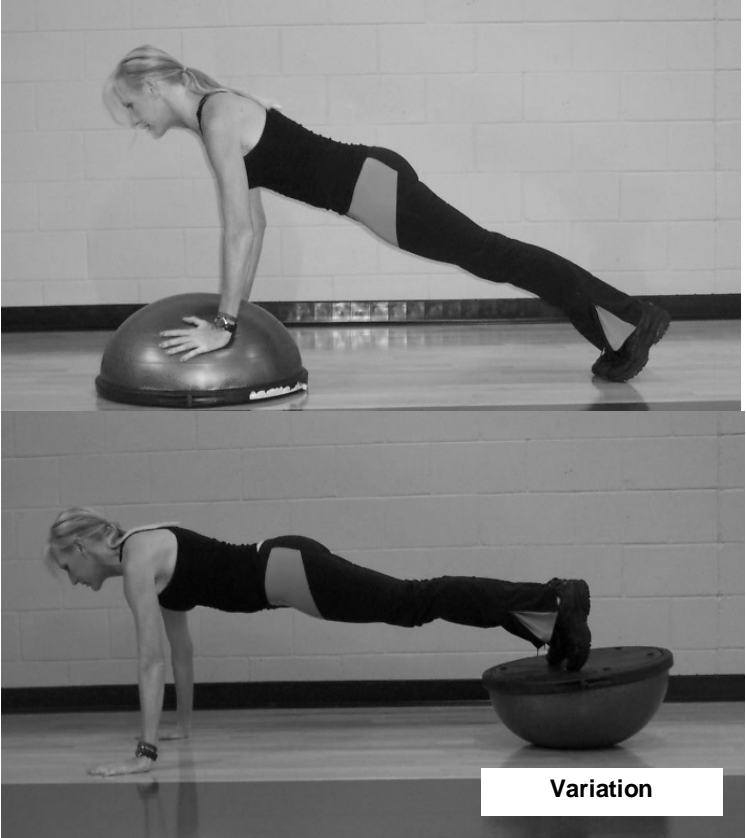
Core	Basic	Intermediate	Advanced	Functional Basic	Functional Intermediate	Functional Advanced
Exercise	Body Weight Only	With Weight	With Weight on Unstable Surface	One-Arm Body Weight Only	One-Arm with Weight	One-Arm with Weight on Unstable Surface
Example	Navel to Spine in Table-Top Position	Navel to Spine in Table-Top Position with Pillow Between Legs	Navel to Spine in Table-Top Position with Pillow Between Legs, with the Hands and Knees on Foam Rollers	Navel to Spine in Table-Top Position with Right Arm and Left Leg Extended (Four-Pointer)	Navel to Spine in Four-Pointer Position Balancing a Pole on Back.	Navel to Spine in Four-Pointer Position Balancing a Pole on Back with Hands and Knees Balancing on Foam Rollers
Lower Body	Basic	Intermediate	Advanced	Functional Basic	Functional Intermediate	Functional Advanced
Exercise	Body Weight Only	With Weight	With Weight on Unstable Surface	One-Legged Body Weight Only	One-Legged with Weight	One-Legged with Weight on Unstable Surface
Example	Squat	Squat with 10 lb Bar	Squat with 10 lb Bar on CoreBoard	One-Legged Squat	One-Legged Squat with 10 lb Bar	One-Legged Squat with 10 lb Bar on CoreBoard
Upper Body	Basic	Intermediate	Advanced	Functional Basic	Functional Intermediate	Functional Advanced
Exercise	Body Weight Only	With Weight	With Weight on Unstable Surface	One-Arm Body Weight Only	One-Arm with Weight	One-Arm with Weight on Unstable Surface
Example	Push-Up on Knees	Push-Up on Toes	Push-Up on Toes on Stability Ball	One-Arm Push-Up on Knees	One-Arm Push-Up on Toes	One –Arm Push-up with one hand on a Medicine Ball

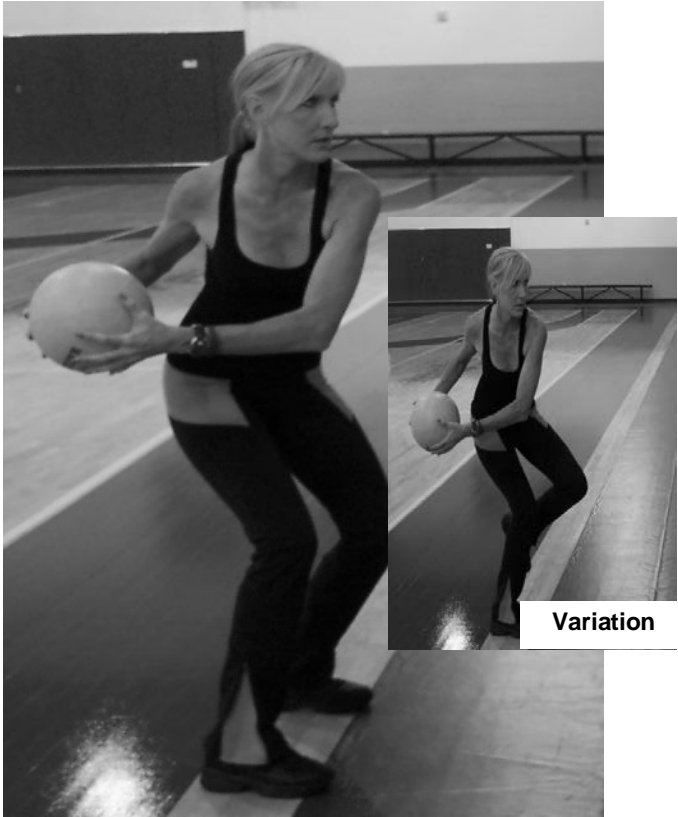

Developing Core and Functional Strength

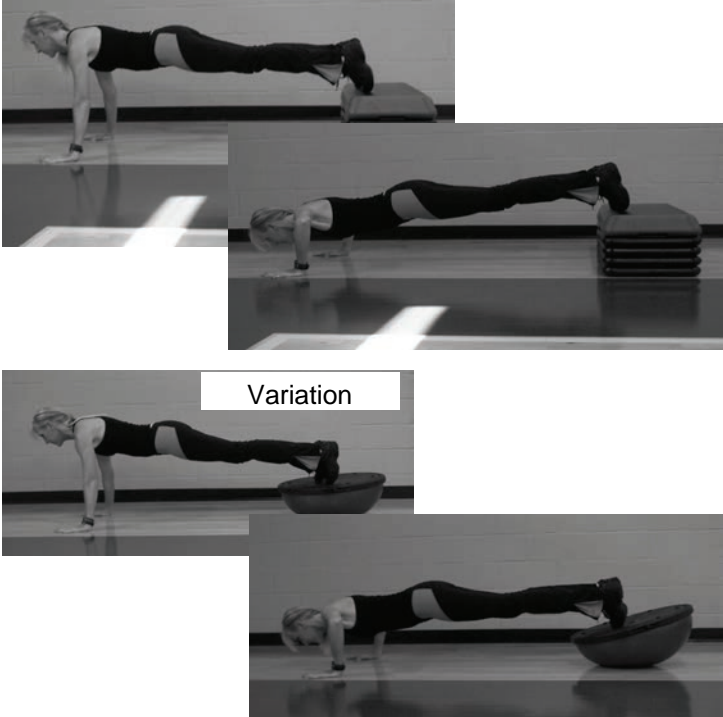
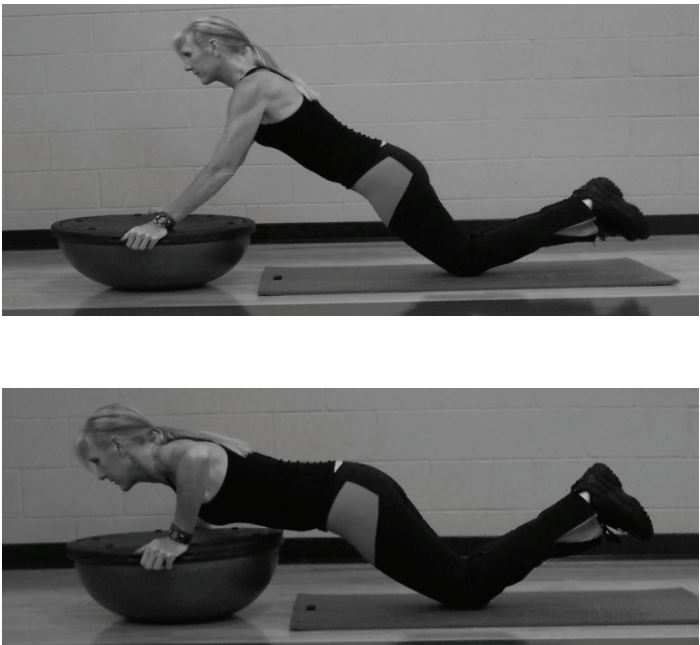
Core Exercise	Technique	Exercise Image
<p>Navel to Spine Crunch</p> <p>Equipment Needed: Mat</p> <p>See 3 Week Progression for Sets and Reps</p>	<p>Lie down on a mat in a supine position. The hands are behind your head with your elbows wide. The feet are placed on the floor about hip-width apart and the knees are bent. Pull your navel to your spine by contracting your abs. Engage the gluteal and adductors. Lift your head and shoulders off the mat keeping your elbows wide, leading from the breast bone. Hold this contraction for 10 seconds, lower the head and shoulders down to the floor and repeat.</p>	
<p>Ball Crunch</p> <p>Equipment Needed: Stability Ball</p> <p>See 3 Week Progression for Sets and Reps</p> <p>Avoid rolling the ball forward & backward when performing this exercise. Avoid rounding completely over the ball during the 'down' phase of the crunch.</p>	<p>Lie down on the ball in a supine position with the lower back on the ball and the upper back resting comfortably on the ball. The feet are placed on the floor about hip-width apart and the hands are lightly placed behind the head with the elbows out to the sides. Engage the core. Inhale to prepare, then exhale as you curl the torso up and forward leading from the breast bone, contracting the abdominal muscles. Lift the shoulders and upper back off the ball but keep the lower back on the ball. Avoid pulling on the neck. Inhale as you lower back down to the ball. Repeat</p>	

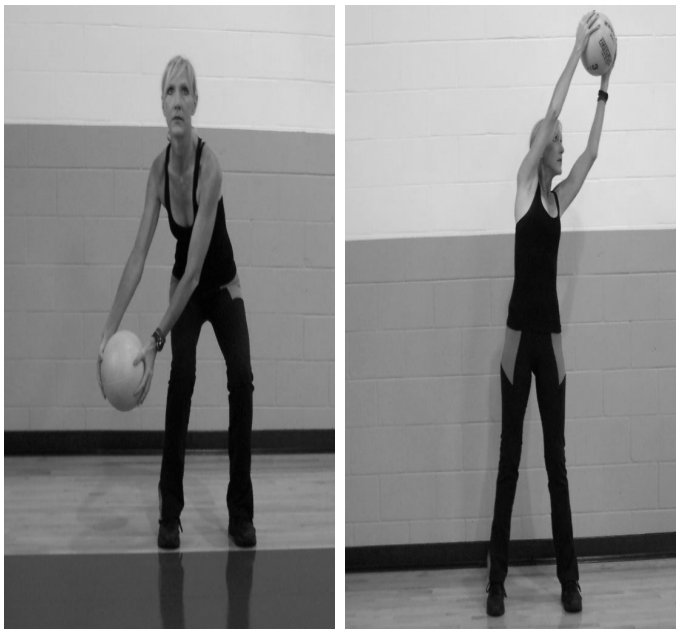
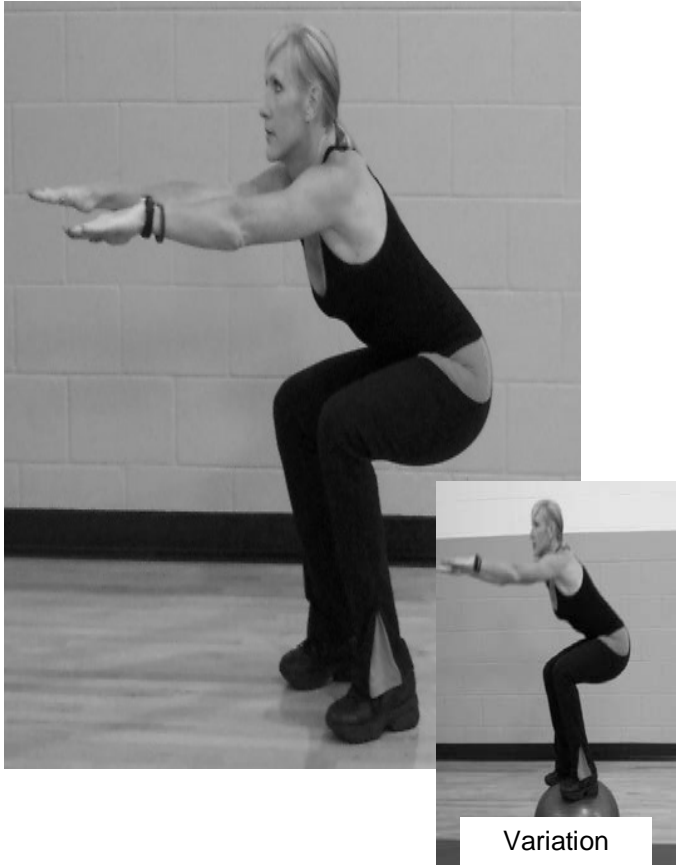
Core Exercise	Technique	Exercise Image
<p>Ball Reverse Crunch</p> <p>Equipment Needed: Stability Ball</p> <p>See 3 Week Progression for Sets and Reps</p>	<p>Lie down supine on the floor with the back flat against the floor. The knees are bent with the exercise ball placed under the knees. The feet are hooked over the ball to secure the position of the legs. Keep the knees at 90°. Use the core to lift the hips off the floor bringing the knees towards the chest. Slowly lower the hips back down to the floor. Repeat.</p>	
<p>Supine Bridge</p> <p>Equipment Needed: Mat</p> <p>See 3 Week Progression for Sets and Reps</p> <p>To make it more difficult lift one leg as you bridge.</p> <p>Avoid rising and resting on the neck.</p> <p>Tight hip flexors and weak glutes may hinder one to lift hips high without experiencing low back pain.</p>	<p>Lie down in a supine position on the floor. The arms are along side your body. The feet are placed on the floor about hip-width apart and the knees are bent. Engage the core. Inhale to prepare. Exhale as you articulate from the tail bone through the entire spine peeling your back up off the mat. Lift your hips as high as you can, leading from the groin/tailbone—not the top of the hips, hold for one second as you inhale, and lower your spine back down to the floor imprinting one vertebra at a time into the mat as you exhale. Your tailbone is the last to come down. Repeat.</p>	



Core Exercise	Technique	Exercise Image
<p>Ball Bridge</p> <p>Equipment Needed: Stability Ball</p> <p>See 3 Week Progression for Sets and Reps</p> <p>NOTE: For variation, can be performed with one leg lifted</p> <p>Avoid rolling the ball forward & backward when performing this exercise. Tight hip flexors and weak glutes may hinder one to lift hips high without experiencing low back pain.</p>	<p>Sit on the ball with feet hip-width apart on the floor and knees at 90 degrees. Walk your feet out to where the head and shoulders are resting on the ball comfortably. The quads are parallel to the floor, the knees are at 90 degrees, and the hips are lifted. Inhale as you lower the glutes towards the floor by articulating each vertebra. Exhale as you push from the heels, squeeze the glutes and lift the hips back up to beginning position, leading from the groin/tailbone. Keep abs engaged. Keep neck and shoulders relaxed. Walk back up to seated position when finished. Repeat</p>	 <p>Variation: One Leg Bridge</p>
<p>Russian Ball Twist</p> <p>Equipment Needed: Stability Ball Medicine Ball</p> <p>See 3 Week Progression for Sets and Reps</p> <p>Keep the medicine ball in a direct line with the shoulders at all phases of the arc, with arms extended the entire time.</p>	<p>Lie supine on the stability ball with the shoulders resting on the ball. The feet are placed on the floor about hip-width apart with the knees bent. The arms are extended straight up while the hands are grasping the medicine ball. The abs are engaged with the hips lifted as high as possible, leading from the groin/tailbone. Slowly roll over to one shoulder while keeping the arms straight. Then slowly roll over the other shoulder. The action originates from the core the entire time.</p>	

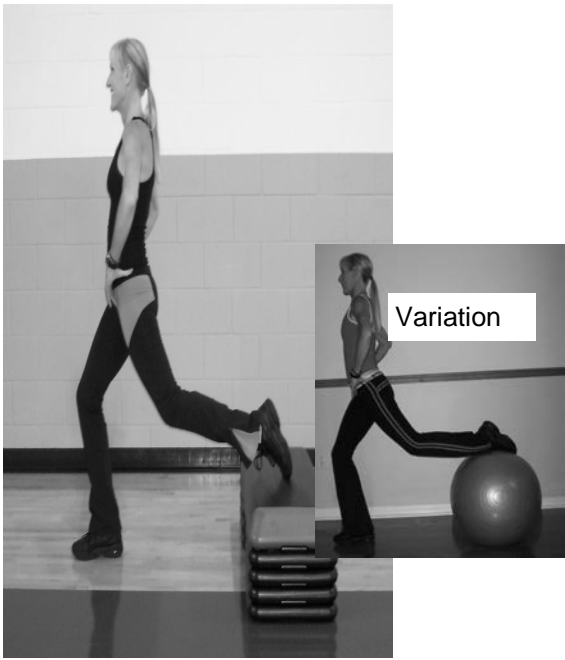

Core Exercise	Technique	Exercise Image
<p>Four Point Balance “Quadruped” Equipment Needed: Mat</p> <p>See 3 Week Progression for Sets and Reps</p> <p>To make it more challenging, place a dowel (stick) across your back to eliminate any hip rotation.</p>	<p>From a table-top position on your hands and knees, extend your right arm straight out and your left leg straight back. Reach in opposition for about 10 seconds. Lower down and repeat on the other side. Keep your abs engaged and your head neck and spine in alignment. Really reach through your fingertips and toes. Keep your hips and shoulders squared off to the floor. Keep supporting limbs ‘spongy’. Use a closed fist if experiencing wrist issues</p> <p>NOTE: For Variation, can be performed on Stability Ball</p>	 <p>Variation</p>
<p>Plank</p> <p>Equipment Needed: BoSU, Stability Ball, OR 2 Medicine Balls</p> <p>See 3 Week Progression for Sets and Reps</p> <p>Use just your body weight when beginning.</p>	<p>In a plank position, place your hands as wide as you can on the BoSU with the dome side down with your legs extended straight back and your toes on the floor about hip-width apart. Your knees are lifted off the floor. Slightly tuck your pelvis under to protect your lower back. Keep your head, neck, and spine straight and in alignment. Keep your shoulders away from your ears by pulling your shoulder blades back and down. Hold for about 15-30 seconds rest and repeat up to 3 sets</p> <p>To Modify: Lower your knees or place the dome side up. You can also use the stability ball instead.</p> <p>To Progress: Use 2 medicine balls with each hand on one ball.</p> <p>VARIATION: Can be performed in “Reverse Plank” as pictured.</p>	 <p>Variation</p>



Upper Body Exercise	Technique	Exercise Image
<p>Front Twist Throw</p> <p>Equipment Needed: Medicine Ball and a Partner or Wall</p> <p>See 3 Week Progression for Sets and Reps Not only does this exercise work the upper body but also the core.</p> <p>Variation: Can be performed standing on one leg.</p>	<p>Stand about 5 feet away from the wall or partner holding the medicine ball with both hands. Your feet are about hip-width apart squared off to the wall. The knees are slightly bent with the hips down and back. Rotate your torso to one side and throw the ball against the wall. Allow the power to radiate from the feet up through the hips, torso and into the arms. Quickly catch the ball and perform again on the same side. Rest 1 min. between sets. Progress with speed and power as opposed to increasing weight</p> <p>Make the ball come back to you. Make sure to follow thru with the motion.</p>	 <p>Variation</p>
<p>Standing Overhead Throw</p> <p>Equipment Needed: Medicine Ball and a Partner or Wall</p> <p>See 3 Week Progression for Sets and Reps Not only does this exercise work the upper body but also the core.</p>	<p>Stand about 5 feet away from the wall or partner holding the medicine ball with both hands. Your feet are about hip-width apart and squared off to the wall. The knees are slightly bent. Extend your arms overhead and throw the ball against the wall. Quickly catch the ball and perform again on the same side. Rest 1 min. between sets. Progress with speed and power as opposed to increasing weight. Options: Step into the throw or use a staggered stance on each leg. Make the ball come back to you. Make sure to follow thru with the motion.</p>	

Upper Body Exercise	Technique	Exercise Image
<p>Reverse Push-Up on Step</p> <p>Equipment Needed: Step</p> <p>See 3 Week Progression for Sets and Reps Beginners should not elevate feet right away. Build up to elevating feet. Step height should be high enough so that the heels fall in a straight line with the shoulders.</p> <p>To Modify: Lower your knees to the floor. VARIATION: Can be performed with Bosu</p>	<p>In a plank position, place your hands wide on the floor with your legs extended straight back and your toes resting on the step. Your knees are lifted off the floor. Slightly tuck your pelvis under to protect your lower back. Keep your head, neck, and spine straight and in alignment. Keep your shoulders away from your ears by pulling your shoulder blades back and down. Lower your chest towards the floor bending your elbows to 90°. Push back up to beginning position and repeat.</p>	
<p>Push-Up Hands on Bosu, or Stability Ball</p> <p>Equipment Needed: Bosu, or Stability Ball</p> <p>See 3 Week Progression for Sets and Reps Beginners should not try right away. Build up to an unstable surface</p> <p>Watch for the BoSU rocking forward/backward. If experiencing low back issues, place body in a 'Quadruped' position and continue with push by flexing and extending at the elbow.</p> <p>To Modify: Lower your knees to the floor. You can also use the stability ball or Bosu instead. This variation is shown in the picture.</p> <p>To Progress: Use 2 medicine balls with each hand on one ball.</p>	<p>BoSU dome side down. In a plank position, place your hands as wide as you can on the BoSU with your legs extended straight back and your toes on the floor about hip-width apart. Your knees are lifted off the floor. Slightly tuck your pelvis under to protect your lower back. Keep your head, neck, and spine straight and in alignment. Keep your shoulders away from your ears by pulling your shoulder blades back and down. Lower your chest towards the Bosu. The elbows bend to 90° then push up to beginning position. Repeat.</p>	

Lower Body Exercise	Technique	Exercise Image
<p>Diagonal Ball Raise</p> <p>Equipment Needed: Medicine Ball</p> <p>See 3 Week Progression for Sets and Reps</p> <p>Not only does this exercise work the lower body but the entire body as well.</p>	<p>Begin in a squat position with hips sitting way back and the knees behind the toes. The arms are down along one side of the body with both hands holding the medicine ball to the outside of the hip. Stand up and extend the arms across the body reaching the ball to the ceiling on the other side using a torso twist and rotation at the hips. Squat back down and repeat on the same side for the correct amount of reps and change sides.</p> <p>Gaze follows the ball</p>	
<p>Body Weight Squat</p> <p>Equipment Needed: None</p> <p>See 3 Week Progression for Sets and Reps</p> <p>Before moving on to more challenging exercises, one should learn the proper technique for squatting.</p>	<p>Stand with the feet hip-width apart and the toes slightly turned out about 10°. The arms are extended straight out at shoulder height. Inhale to prepare and sit the glutes back and down to where the quads are parallel to the floor. Sit the body weight back into the heels. Keep the knees behind the toes as you sit down. Stand back up by pushing the heels to the floor. Keep chest lifted and abs engaged. Repeat.</p> <p>VARIATION: Can be performed on Bosu as an “Instability” Squat</p>	

Lower Body Exercise	Technique	Exercise Image
<p>Skater's One-Leg Squat</p> <p>Equipment Needed: 16 Inch Step</p> <p>See 3 Week Progression for Sets and Reps</p>	<p>Stand on the step with one foot. Squat back lowering the hips and glutes towards the step. As you squat down, extend the free leg backwards while lowering the chest towards the front quad. As you are lowering down, your arms extend forward. Lower down to where the front quad is parallel to the step. Place the body weight into the heel. As you stand back up, press through the heel. Lower the arms back down as you stand up. Repeat for as many reps as you can and switch legs.</p>	
<p>Overhead Static Lunge</p> <p>Equipment Needed: Dowel or Stick</p> <p>See 3 Week Progression for Sets and Reps</p> <p>To modify remove the dowel and place the hands behind the head with the elbows wide. Follow same beginner steps as discussed in Warm Up Exercises section.</p>	<p>Stand in a split stance with your right foot planted forward and left leg back with the ball of the left foot in contact with the floor and the heel lifted. The arms are extended straight overhead holding the dowel with a wide grip. Lower your back knee down to the floor bending both knees to 90°. The front knee remains behind the front toes. Keep your chest upright and your abs engaged. Stand back up by pushing off the front foot. Repeat for the correct amount of reps and then change legs.</p>	

Lower Body Exercise	Technique	Exercise Image
<p>Static One-Leg Lunge</p> <p>Equipment Needed: 16 Inch Step</p> <p>See 3 Week Progression for Sets and Reps</p> <p>VARIATION: Can be performed with Stability Ball or Bosu</p> <p>Follow same beginner steps as discussed in Warm Up Exercises section.</p>	<p>Stand in a split stance with your right foot planted forward and left leg back and the top of the foot resting on the step. The hands are placed behind the head or on the hips with the elbows out to the sides wide. Bend your front knee to 90° while lowering your back knee down to the floor. The front knee remains behind the front toes. Keep your chest upright and your abs engaged. Stand back up by pushing off the front foot. Repeat for the correct amount of reps and then change legs.</p>	 <p>The main image shows a woman performing a static one-leg lunge on a 16-inch step. She is in a split stance with her right foot forward on the step and her left leg back, with the top of her foot resting on the step. Her hands are behind her head, and her elbows are out to the sides. A smaller inset image labeled 'Variation' shows the same exercise performed with a stability ball under the back foot.</p>
<p>Step Up</p> <p>Equipment Needed: Minimum 12 Inch Step</p> <p>See 3 Week Progression for Sets and Reps</p> <p>VARIATION: Can be performed Laterally.</p> <p>Use Bosu to increase instability</p> <p>Watch for forward lean thru chest and hips when stepping up– similar to ‘scooping’ the body onto the step.</p>	<p>Facing the box, place one foot entirely on the box and the other foot is on the floor. Place the hands behind the head or on the hips with the elbows wide out to the sides. Push down through the heel that is on the box to stand up on top of the box. In the top position, balance on the supporting foot never allowing the trailing foot to touch the box. For an added glute workout of the free leg, extend the free leg backwards. Keep chest upright and abs engaged. Step back down and repeat on same leg for the proper amount of reps then switch legs.</p>	 <p>The main image shows two side-view photos of a woman performing a step up. In the first photo, she is stepping up with her right foot onto a 12-inch step, with her left foot on the floor. In the second photo, she is standing on the step with her right foot, and her left leg is extended backwards. Below this, a smaller inset image labeled 'Variation: Lateral Step Up' shows the woman performing a lateral step up, stepping up with her right foot onto a step while her left leg is extended to the side.</p>

Lower Body Exercise	Technique	Exercise Image
<p>Lateral Lunge</p> <p>Equipment Needed: None</p> <p>See 3 Week Progression for Sets and Reps</p> <p>To progress, you can add weight and then add an unstable surface.</p>	<p>Stand in a wide stance about 4 feet wide or as wide as you can. Place the hands behind the head with the elbows wide out to the sides. Sit to one side sitting in the back of the heels. Keep the knee behind the toes. Keep the abs engaged and the chest upright. As you shift your body weight back up to standing, press through the heel. Repeat for the proper amount of reps then switch sides.</p>	
<p>Side Leg Lifts</p> <p>Equipment Needed: Bosu or Stability Ball</p> <p>See 3 Week Progression for Sets and Reps</p> <p>Options: Perform the same leg lifts using the stability ball.</p>	<p>In a side-lying position over the Bosu, place the hands behind the head with the elbows out wide to the sides. With the hips stacked, lift the top leg as high as the hips. The foot of the lifting leg is dorsiflexed. Lower the leg back down to beginning position and repeat. Perform the proper amount of reps then switch legs. For variety, you can swing the leg forward and back and then perform small leg circles.</p>	



REVIEW #7

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. **Explain the term “Core Stabilization” and how to verbally cue a client to achieve “Core Stabilization” in a training session.**
2. **What is the most important thing to master before progressing from Beginner Level of Core & Functional Strength exercises to an unstable piece of equipment.**
3. **What is *The 3-Week Progression* rule of thumb for how much weight should be used when performing exercises for Weeks 1-3?**
4. **According to the Guidelines for *The 3-Week Progression*, weighted activities can be added after Week ____.**
5. **According to the Guidelines for *The 3-Week Progression*, instability activities can be added after Week ____.**
6. **One Arm or One Leg Exercises can be added after Week ____.**
7. **It is important to remember to always “*Progress from simple to _____.*”**
8. **True or False? It is appropriate to use heavy weights when performing Core & Functional Training movements, especially when using a Stability Ball or BOSU.**
9. **Describe the progression of a Basic Squat to a One-Legged Squat with 10-Pound Bar on a Balance Disc.**

Fitness Performance

Slow Stretches

Hip Flexors



Quads



Hamstrings



Hips and Glutes



I T Band and Abductors









Adductors



Fitness Performance

Slow Stretches

(Continued)

Gastrocnemius	ABS	Lower Back
		
Upper Back	Chest	Triceps
		

Fitness Performance

Slow Stretches

(Continued)

Biceps



Shoulders



Lats



Obliques



Neck



Total Body



Example Beginner Workout

Weeks 1-3

Warm-Up/Exercise/Stretch	Time	Reps Week 1: 8 Week 2: 10 Week 3: 12	Sets	Equipment
Linear Warm-Up				
High Knee Walk	2.5 Minutes			None
High Knee Run	2.5 Minutes			None
Core Workout				
Navel To Spine Crunch		8-12	3	Mat
Four Point Balance		8-12	3	Mat/Try Adding the Ball on Wk 2
Plyometrics				
Box Jump		5	5	Begin with 8 inch step
Hurdle Jump		3	5	Begin with three 8 inch hurdles
Speed/Agility				
Conventional Suicide Drill		6 Cones	5	6 Cones
Ladder Drill			5	Run through the ladder with quick steps
Cool Down/Walk	2 Minutes			
Upper Body				
Push-Up		8-12	3	No Equipment
Standing Overhead Throw		8-12	3	Medicine Ball/Wall
Lower Body				
Body Weight Squat		8-12	3	None
Overhead Static Lunge		8-12	3	Dowel/Stick
Stretch Entire Body	Hold each stretch 15-20 seconds			

Example Intermediate Workout

Weeks 4-6

Warm-Up/Exercise/Stretch	Time	Reps Week 4: 8 Week 5: 10 Week 6: 12	Sets	Equipment
Linear Warm-Up				
Heel Slaps	2.5 Minutes			None
Jump Running	2.5 Minutes			None
Core Workout				
Ball Crunch		8-12	3	Stability Ball
Ball Bridge		8-12	3	Stability Ball
Ball Reverse Crunch		8-12	3	Stability Ball/Mat
Plyometrics				
One-Leg Box Jump		5	5	Begin with 8 inch step
One-Leg Hurdle Jump		3	5	Begin with three 8 inch hurdles
Speed/Agility				
Up Hill Sprint			5	Hill
Hollow Sprint			5	6 Cones
Cool Down/Walk	2 Minutes			
Upper Body				
Reverse Push-Up on Step		8-12	3	12 Inch Step
Front Twist Throw		8-12	3	Medicine Ball/Wall
Chin-Up		Max	3	Bar or Chin-Up Machine
Lower Body				
Instability Squat		8-12	3	Balance Disks, Bosu, or Core Board
Diagonal Ball Raise		8-12	3	Medicine Ball
Static One-Leg Lunge		8-12	3	Step
Stretch Entire Body	Hold each stretch 15-20 seconds			

FiTOUR® Core & Functional Training Certification
Volume 2

PART II



Active Older Adults **Activities of Daily Living**

A Comprehensive Guide to Assessment, Development and Implementation of Core & Functional Programming for Active Older Adults as it relates to Health and Activities of Daily Living.

The information contained in Part II will provide useful tools and information which will enable the Fitness Professional to design safe and effective programming for Active Older Adults.

Introduction to Core & Functional Training for Active Older Adults

Active Older Adult Fitness Programming that utilizes Core & Functioning Training will provide the skills needed for optimal Fitness & Health and Activities of Daily Living (ADL).

Fitness Goals of Active Older Adults

The fitness goals of the Active Older Adult will vary somewhat from the fitness goals of younger participants. While many Active Older Adults are able to continue with their regular fitness program well into their sixties and seventies, modifications may become necessary due to orthopedic and other physical issues related to the aging process.

As a fitness trainer/instructor to Active Older Adults, it is important that you understand that the goals of the aging participant most likely change. An individual who participated in marathon races through their 40's most likely will have significantly different fitness goals in their 60's.

- **Goals of Active Older Adults**
 - Maintain independence and function for ADL
 - Continued high-quality of life
 - Fitness/Sports Activities
 - Dressing
 - Bathing
 - Driving
 - Yard & Housework
 - Caring for Grandchildren
- **Goals of Trainer/Instructor of Active Older Adults**
 - Provide programs and opportunities to maintain and improve fitness to insure a high quality of life
 - Muscular strength and endurance
 - Cardiovascular strength
 - Flexibility
 - Functional movement

Benefits of Participating in Functional Training for Active Older Adults

- Increased bone density
- Improved coordination
- Improved/maintain flexibility
- Improved functional movement
- Improved strength and endurance
- Improved posture
- Improved balance
- Prevention of Injury
- Functional Independence which is a primary contributor to quality of life

Activities of Daily Living

Below is a brief list of common Activities of Daily Living. This list provides various types of movements encountered by your clients/students on a daily basis. This list is by no means to be considered complete. Activities of Daily Living will be different and unique for each individual.

Upper Body Tasks

- Lifting and lowering
 - Picking up bags of groceries
 - Folding clothes
 - Preparing meals
- Pushing and Pulling
 - Dusting
 - Trimming Shrubs/Flowers
- Raising Arms Overhead
 - Putting on shirt/blouse
 - Washing hair
 - Placing/removing items from overhead



Lower Body Tasks

- Maintaining Balance
 - Playing golf/tennis
 - Walking on uneven or slippery surface
 - Dancing
 - Getting in and out of shower
- Squatting and bending
 - Housekeeping
 - Playing with grandchildren
 - Yardwork/Gardening
- Sitting and Standing
 - Getting in and out of automobile
 - Getting in and out of bathtub
- Walking/Ambulation
 - Climbing stairs
 - Descending stairs
 - Pushing Wheelbarrow/Lawnmower

Target Muscles

Upper Body Muscles

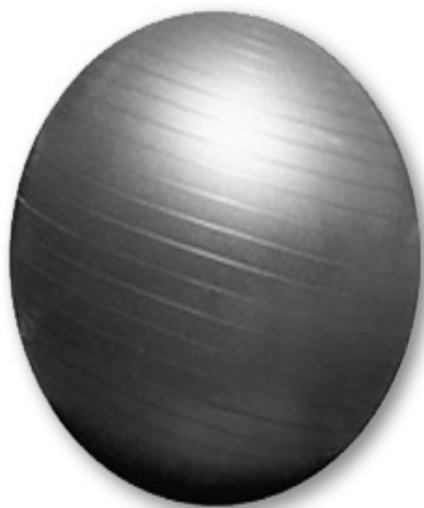
Deltoids (Shoulders)
Trapezius (Upper Back)
Pectorals (Chest)
Latissimus Dorsi (Back)
Triceps/Biceps (Upper Arms)
Biceps brachii, brachialis, brachioradialis (Forearm)
Wrist Extensors

Lower Body Muscles

Erector Spinae
Abdominals
Quadriceps (Front of Thigh)
Hamstrings (Back of Thigh)
Gluteal maximus (Buttocks)
Hip (Abductors and Adductors)
Tibialis Anterior (Front of Lower Leg)
Gastrocnemius/Soleus (Back of Lower Leg)

Core and Functional Training Equipment for Active Older Adults

- **Stability Ball:** (see size recommendations on page 15)
- **Medicine Ball:** 1-3 kg
- **Light Weight Balls:** Kickballs/Children's balls in various sizes
- **Step(s):** 4—8 inches in height
- **Hand-Held Weights/Dumbbells:** 2-8lbs.
- **Resistance Bands:** Light to medium resistance. Handles may be useful for clients who have weak hand muscles or arthritis.



Always inspect equipment for damage prior to usage.



Program Design for Core & Functional Training for Active Older Adults

The following information is provided to assist the fitness trainer in designing a program for the “apparently healthy” Active Older Adult. FiTOUR® recommends that fitness trainers who will work with Older Adults who may fall under the category of “Special Population” (i.e. Cardiac/Stroke Rehab, Diabetic, Osteoporosis, Arthritis) go through the FiTOUR® Senior Certification Program.

Session/Class Format:

- I. **Warm-Up (5-10 minutes):** The purpose of the Warm-Up is to increase the core temperature of the body and to prepare the body for more rigorous activity. Perform exercises at a pace which will provide controlled movement. Rhythmic limbering should be utilized during the Warm-Up. The Warm-Up portion of a training session is an ideal time for clients to practice the exercises that will be used during the Work-Out portion of the session.
- II. **Work-Out/Skills Drills (20-35 minutes):** The Work-Out/Skills Drills should include at least one exercise for each major muscle group and at least one exercise from each section below:
 - Muscle Strengthening
 - Balance
 - Center of Gravity
- III. **Flexibility/Cool-Down (10-30 minutes):** The Flexibility portion signals the end of the training session and should gradually slow the heart rate. The exercises used during the Warm-Up can be used for the Cool-Down followed by specific flexibility exercises.

Music:

When selecting music for the Active Older Adult Core & Functional Training session, choose music that appeals to the age and demographics of the participants. For example, many music companies provide “Senior” music which may include Big Band sounds. Be aware that many of your Active Older Adults were not even born when Big Band was popular. Active Older Adults ranging in age from 55-70 will enjoy music that was popular when they were younger. Active Older Adults who fall into the age category of 55-65 were in high school and college between 1958 and 1975. These adults would most likely enjoy music from the 1970’s.

Beats Per Minute (BPM):

- Up to 130

*Note: Active Older Adults who may have slower reaction time, less agility and lower skill levels may require music that is slower paced.

Recommendations for Trainers Working with the Active Older Adult Population:

- *FiTOUR® recommends that Fitness Professionals who will lead Group Exercise Training Sessions for Active Older Adults complete the FiTOUR® Primary Group Exercise Instructor Certification Program and the FiTOUR® Senior Certification Program.*
- *FiTOUR® recommends that Fitness Professionals who will conduct/design One-On-One and/or Group Personal Training Programs for Active Older Adults complete the FiTOUR® Primary Personal Trainer Certification Program and the FiTOUR® Senior Certification Program.*



REVIEW #8

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.


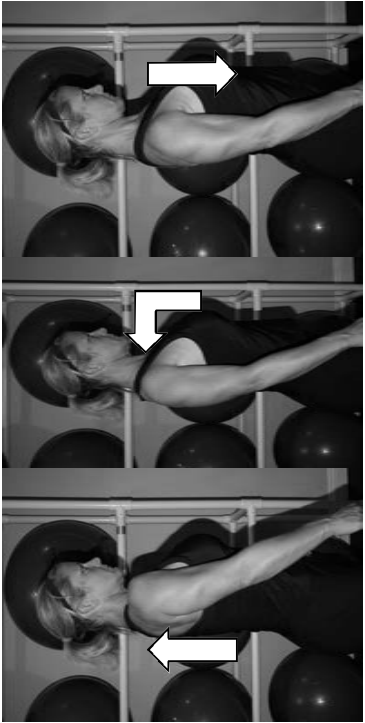
- 1. Explain briefly how the fitness goals of Active Older Adults will vary from the fitness goals of younger participants. Explain and list the common Goals of Active Older Adults. Explain and list the common Goals of a Trainer/Instructor for Active Older Adults.**
- 2. List Upper Body and Lower Body Tasks that might be a part of an Active Older Adult's every day activities and explain how participating in Functional Training activities can translate to more efficient movement during these every day activities.**
- 3. What height Step is recommended for the Active Older Adult?**
- 4. What is the recommended weight range for Dumbbells/Hand-Held Weights for Active Older Adults?**
- 5. What resistance level and what attachment is recommended for Rubber Bands when working with Active Older Adults?**
- 6. What is the purpose of and how much time should be devoted to the Warm-Up portion of an Active Older Adult Functional Training Class/Session?**
- 7. List the three components that should be addressed during the Work-Out/Skills Drills portion of an Active Older Adult Functional Training Class/Session.**
- 8. How much time should be devoted to the Flexibility/Cool-Down portion of an Active Older Adult Functional Training Class/Session?**
- 9. What is the recommended Beats per Minute for Music during an Active Older Adults Functional Training Class/Session?**

WARM-UP EXERCISES

(5-10 Minutes)



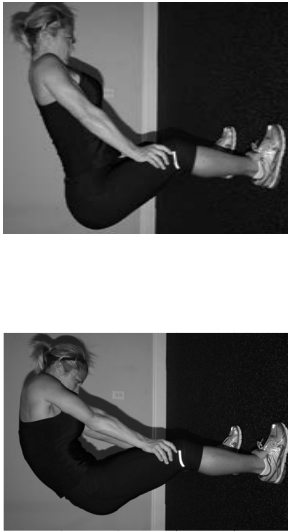
Perform 1-2 sets of 8-16 repetitions of each exercise in a rhythmic fashion if in a Group Exercise Setting. Personal Trainers may opt to perform 1-2 sets of 10-20 repetitions.

Upper Body Warm-Up Exercises can be performed during a Group Exercise Session while marching/walking in place or in a circle around the room.

Exercise/Muscles	Description	Exercise Image
Neck Rolls Target Muscles: Neck	Slowly turn chin over right shoulder. Roll chin slowly forward allowing chin to turn over left shoulder. Repeat in opposite direction. <i>NOTE: Never perform cervical hyperextension by lifting chin and allowing head to drop back</i>	
Shoulder Circles Target Muscles: Deltoids, Trapezius	Slowly circle shoulders backward. Repeat and circle shoulders forward. Rolls can be performed with both shoulders simultaneously or alternating shoulders.	






WARM-UP EXERCISES

(Continued)

Exercise/Muscles	Description	Exercise Image
Overhead Stretch Target Muscles: Deltoids, Trapezius, Lats, Erector Spinae	Stretch arms out to the side and lift up toward the ceiling. Also can be performed one arm at a time or alternating arms.	
Arm Circles Target Muscles: Deltoids If shoulder issues, use a short lever (flexed elbow) version of this exercise.	Hold arms out to sides in a “T”. Circle arms forward. Repeat in opposite direction. May be performed with large or small circles.	
Low Back Target Muscles: Abdominals, Erector Spinae	Stand with feet hip distance apart. Bend knees. Place hands on upper thighs for support. Alternate posterior and anterior pelvic tilts. (Cat/Cow Stretch)	


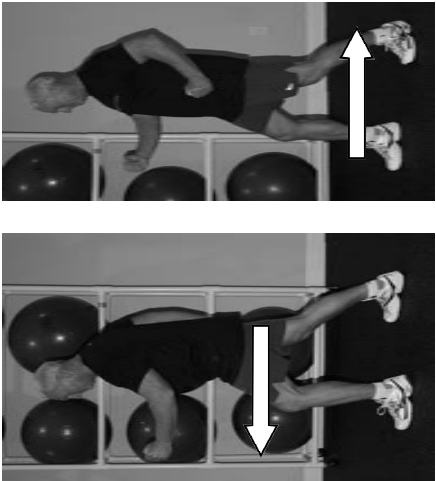
WARM-UP EXERCISES

(Continued)

Exercise	Description	Exercise Image
Heel Raises Target Muscles: Gastrocnemius, Soleus To challenge balance and core, place feet in a split or scissor stance with weight equally distributed across both feet.	Stand with feet hip distance apart. Lift heels up and down. Can be performed with Shoulder Circles, Overhead Stretch or Arm Circles	
Step Touch Target Muscles: Abductors, Adductors	Stand with feet together. Step the right foot out to side. Step the left foot in to the right foot. Step the left foot out to the side. Step the right foot in to the left foot.	 
Knee Ups Target Muscles: Hip Flexors, Quadriceps Avoid pulling on neck, especially if person shows signs of tight chest muscles/inflexibility in the shoulder girdle.	Place hands on hips and perform alternating knee lifts. For more challenge, cross arms across chest or place hands behind head.	 

WARM-UP EXERCISES

(Continued)

Exercise	Description	Exercise Image
Standing Hamstring Curls Target Muscles: Hamstrings	<p>Place hands on hips and perform alternating hamstring curls.</p> <p>For more challenge, hold arms to sides and bring opposite fingers toward opposite heel.</p>	
Walking Forward/Backward Target Muscles: Thighs, Gluteus, Calves, Tibialis Anterior	<p>Walk forward followed by walking backward.</p> <p>To further challenge the mind, encourage that the arms and legs move in opposition (as the right leg travels forward the left arm is also moving forward) Aging process causes individuals to perform same limb movements thus an increase in falls due to center of gravity imbalances.</p>	



REVIEW #9

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

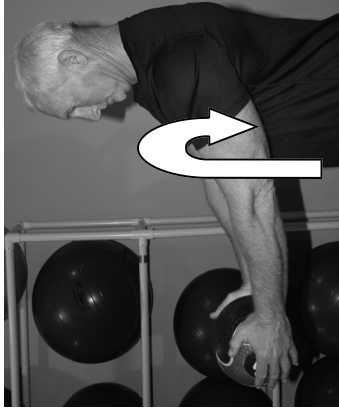

- 1. How many sets and reps are recommended for the Warm-Up Exercises for a Core & Functional Training Group Exercise Class for Active Older Adults?**
- 2. How many sets and reps are recommended for the Warm-Up Exercises for a Core & Functional Personal/One-On-One Training Session for an Active Older Adult?**
- 3. The Upper Body Warm-Up Exercises can be performed during a Group Exercise Session while _____ or walking in place or in a _____ around the room.**
- 4. How long should the Warm-Up Session of a Core & Functional Training Class/Session last?**

MUSCLE STRENGTHENING EXERCISES

The exercises below provide a workout for the Upper Body, Abdominals and Lower Back. Specific Lower Body Strengthening Exercises are not included in this program because the Center of Gravity, Balance and Agility Drills all involve Lower Body Muscles. Additional muscle strengthening exercises appropriate for Active Older Adults can be found in the FiTOUR® Senior Certification Program and other FiTOUR® Programs. When selecting alternate exercises not listed below, use prudence in choosing exercises that are appropriate for client's level of fitness and skill level.


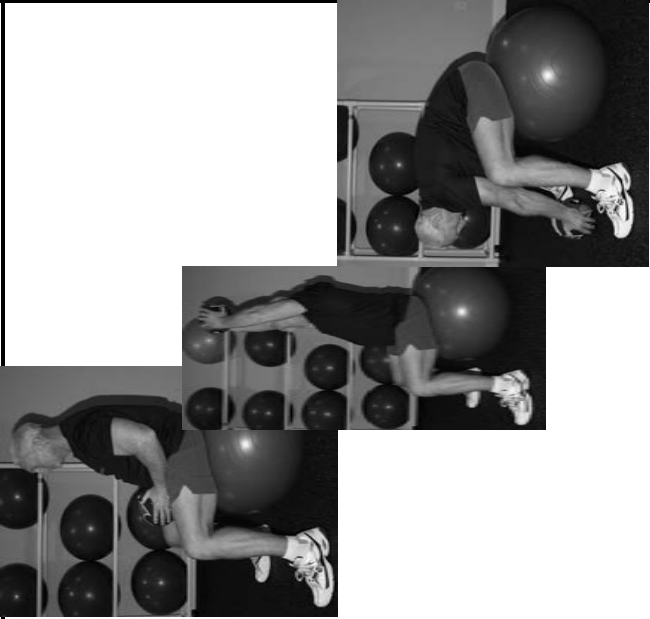
Be mindful of overuse injuries to the shoulders and hips.

Perform 1-3 sets of 10-15 repetitions

Exercise	Description	Exercise Image
Shoulder Shrugs with Hand Weights Target Muscles: Upper Back/Neck If experiencing neck or shoulder issues, flex at the elbow for a short lever exercise.	<p>Stand feet hip distance apart. Hold light dumbbells in each hand. Raise shoulders simultaneously while exhaling. Inhale and return shoulders to starting position.</p> <p>NOTE: Can be performed with medicine ball held in front of the body between both hands.</p> <p>PHOTO shows exercise using medicine ball.</p>	
Side Bend with Hand Weights Target Muscles: Upper/Middle Back, Deltoids and Arms	<p>Stand with feet hip distance apart. Hold light dumbbells in each hand. Inhale. Slowly bend trunk to one side as the weight on the other side is raised to armpit level. Exhale during the side bend. Inhale and return to start position. Repeat on opposite side.</p>	



MUSCLE STRENGTHENING EXERCISES

(Continued)

Exercise	Description	Exercise Image
Standing Chest Press with Resistance Band Target Muscles: Pectorals, Deltoids, and Arms	Stand with feet hip distance apart. Place resistance band around back and under armpits. Hold ends of band. Push arms directly forward while exhaling. Pause at the end of the movement. Slowly return to starting position while inhaling.	
Ball Lifts with Added Balance Challenge Target Muscles: Upper/Middle/Lower Back, Shoulders, Arms, Abdominals	Sit in middle of stability ball with feet flat on the floor at hip distance. Hold a medicine ball at waist level. Press arms overhead while exhaling. Bend forward at hips and lower ball to floor. Return to starting position. Focus on articulating the spine and stacking the spine while keeping the core engaged. If enlarged midsection, stop when chest touches tummy.	

MUSCLE STRENGTHENING EXERCISES

(Continued)

Exercise	Description	Exercise Image
Tricep Extensions with Resistance Band Target Muscles: Triceps	Hold resistance band between both hands with band length equal to width of shoulders. Place in front of the opposite shoulder with elbow bent. Exhale while slowly extending the other arm while keeping the elbow close to the body. Inhale as hand returns to starting position. Repeat on other side.	
Bicep Curls with Added Balance Challenge Target Muscles: Biceps and Abdominals	Sit on stability ball with hand weights, arms extended by sides. Keeping elbows close to sides exhale while lifting weights toward shoulders by bending elbows. Inhale as weights are slowly lowered to starting position	



REVIEW #10

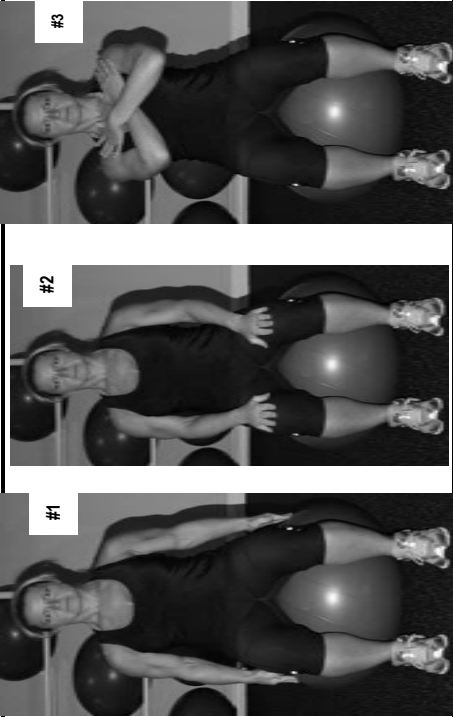
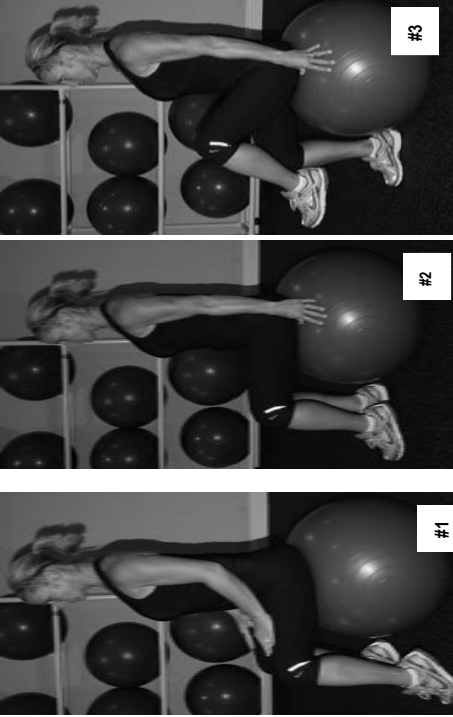
Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. **The Muscle Strengthening portion of a Core & Functional Training Session/ Class for Active Older Adults should include exercises for _____ Body, Abdominals and _____ Back.**
2. **Specific Lower Body Strengthening Exercises are not included in this program due to the inclusion of _____ of Gravity Drills, Balance Drills and _____ Drills all of which include Lower Body Muscles.**
3. **It is recommended to perform _____ sets of _____ repetitions during the Muscle Strengthening portion of a Core & Functional Training session for Active Older Adults.**
4. **When selecting alternate exercises not listed in this program, choose activities that are appropriate for your students'/client's level of _____ and _____ level.**

BALANCE DRILLS

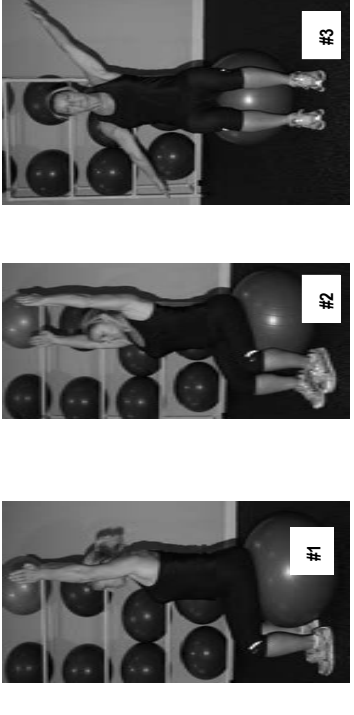
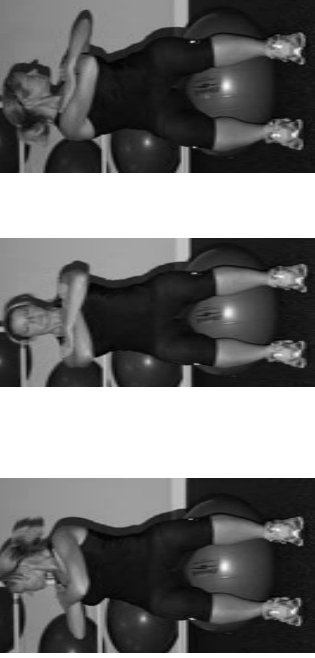
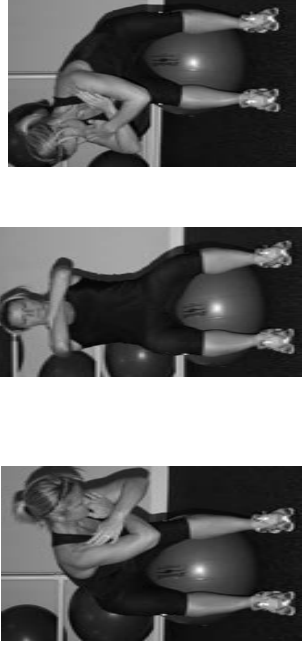
Balance Drills will improve stabilization of the hip, knee and ankle joints. Balance Drills will also target the stabilizers located in the deep core muscles of the torso. Progression of balance exercises should begin in seated position and move to standing and finally to moving.

Perform 1-3 sets of 5-10 repetitions

Exercise	Description	Exercise Image
Hand Positions for Seated Balance on Stability Ball	<p>Hand Position #1: Hands on side of ball</p> <p>Hand Position #2: Hands on thighs</p> <p>Hand Position #3: Hands across chest</p>	
Seated Balance on Stability Ball NOTE: May use for “aerobic” training.	<p>Sit on ball with feet flat on the floor, hip distance apart.</p> <p>Progression #1: Heel Lifts</p> <p>Progression #2: March in Place</p> <p>Progression #3: Alternating Knee Lifts</p>	








BALANCE DRILLS

(Continued)

Exercise	Description	Exercise Image
Seated Balance on Stability Ball with Arm Movements	<p>Sit on ball with feet flat on floor, hip distance apart.</p> <p>Progression #1: Raise one arm to vertical position</p> <p>Progression #2: Raise both arms</p> <p>Progression #3: Perform Diagonal Arm Raises</p>	
Seated Balance on Stability Ball with Lateral Trunk Rotations	<p>Keeping hips forward, slowly rotate over one shoulder. Hold for 4 counts and slowly return to starting position. Repeat on other side.</p>	
Seated Balance on Stability Ball with Diagonal Trunk Lean Front	<p>Slowly lean trunk forward over right thigh. Return to starting position. Repeat with lean toward left thigh.</p>	

BALANCE DRILLS

(Continued)

Exercise	Description	Exercise Image
Standing Balance As balance improves, add Upper Body Movement with Standing Balance	Four Progressions for Standing Balance are suggested: Progression #1: Feet together Progression #2: Feet in T-stance Progression #3: Tight Rope/Toe-Heel Progression #4: One-Legged Stance	   
Standing Balance: Lower Body Movement	Incorporate Lower Body Movement with Standing Balance Activity. i.e. Stand on one foot and roll ball forward/backward and side to side with other foot	  




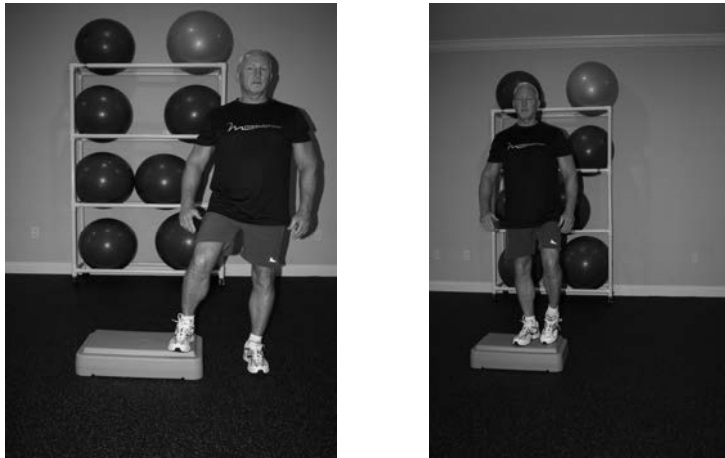

REVIEW #11

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

1. **Balance Drills improve stabilization of the _____, knee and _____ joints.**
2. **Balance Drills target the _____ located in the deep core muscles of the torso.**
3. **Progression of Balance Drills should begin in _____ position, progress to standing and finally to _____.**
4. **What is the recommended number of sets and repetitions for Balance Drills?**
5. **What are the three Hand Positions for Seated Balance on a Stability Ball?**
6. **What are three Lower Body Movements that can be used for “aerobic” training when sitting on a Stability Ball?**
7. **What are the suggested Four Progressions for Standing Balance?**


CENTER OF GRAVITY DRILLS

The Center of Gravity Drills are designed to provide functional training for moving tasks and weight shifts encountered by clients on a daily basis. i.e. leaning over to pick up a dropped item, loading and unloading the dishwasher, removing laundry from the dryer, stepping up and down and lateral movement weight shifts.

Exercise	Description	Exercise Image
Front Toe Taps Use a 2, 4 or 6 inch step platform	<p>Facing step, alternate touching toes into 2, 4 or 6 inch high step.</p> <p>Perform 1-3 x 10 with each lead leg</p>	
Side Toe Taps Use a 2, 4 or 6 inch step platform	<p>Standing with right foot on side of step, step up with right foot and tap step with left toe. Repeat on other side</p> <p>Perform 1-3 x 10 with each lead leg</p>	
Front Step Ups/Step Downs Use a 2, 4 or 6 inch step platform	<p>Stand facing step. Step right foot up, left foot up, right foot down, left foot down. Repeat on other side</p> <p>Perform 1-3 x 10 with each lead leg</p>	

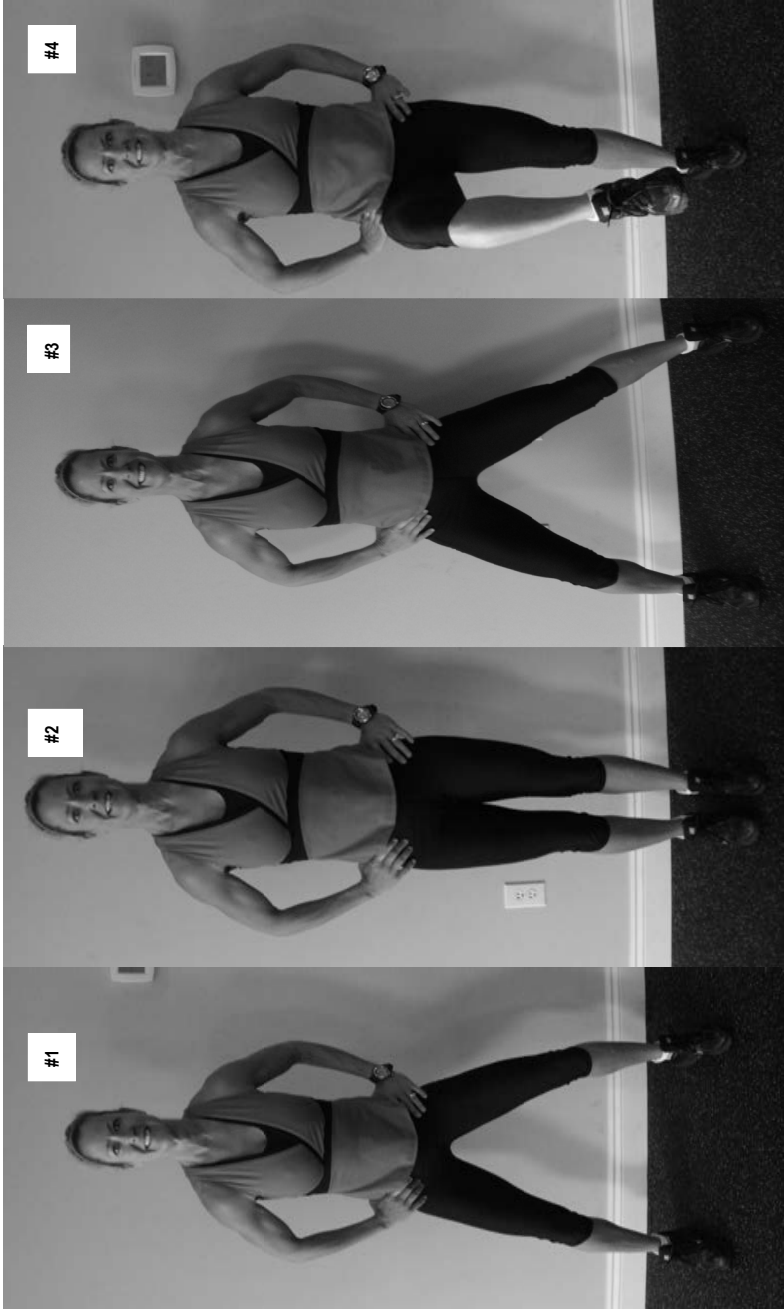
CENTER OF GRAVITY DRILLS

(Continued)

Exercise	Description	Exercise Image
<p>Side Step Ups/ Step Downs</p> <p>Use a 2, 4 or 6 inch step plat- form</p>	<p>Stand on right side of Step.</p> <p>(1) Step right foot up, (2) left foot up, (3) step left foot down, (4) right foot down. Repeat on other side</p> <p>Perform 1-3 x 10 with each lead leg</p>	

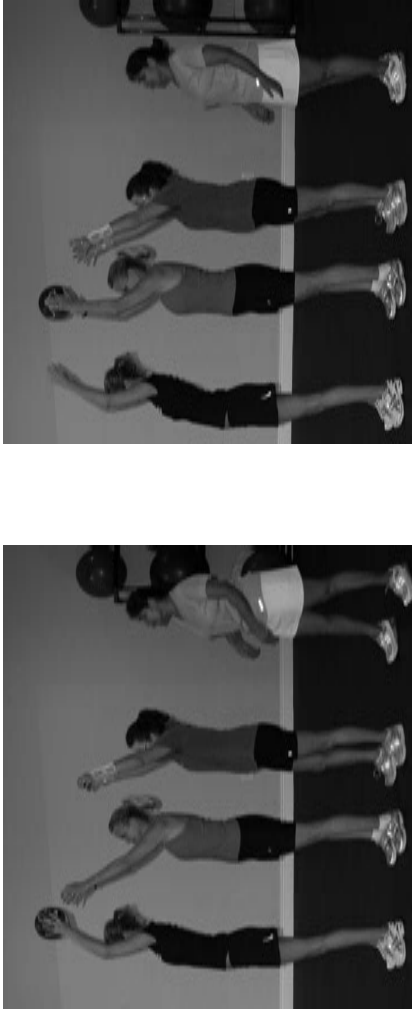
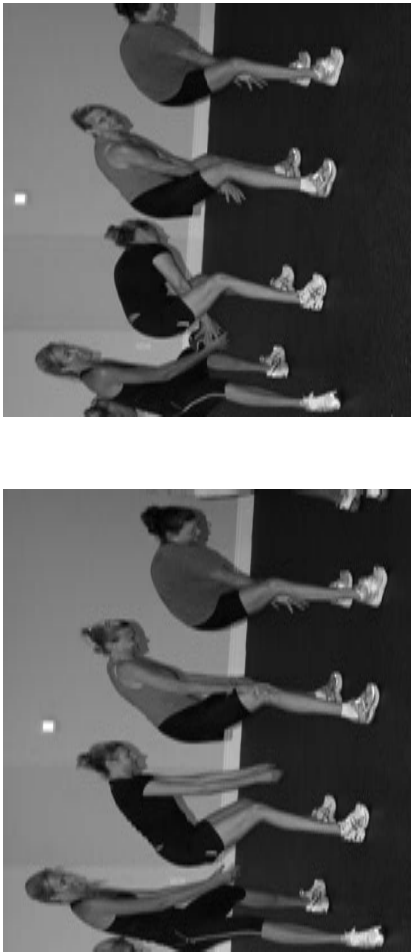
CENTER OF GRAVITY DRILLS

(Continued)

Exercise	Description	Exercise Image
Side Step with Stork Balance	<p>(1) Step right, (2) Step left ending with feet together, (3) Step right, (4) Lift left foot up and hold. Stick the landing Repeat with left foot lead.</p> <p>Perform 1-3 x 10 with each lead leg</p>	


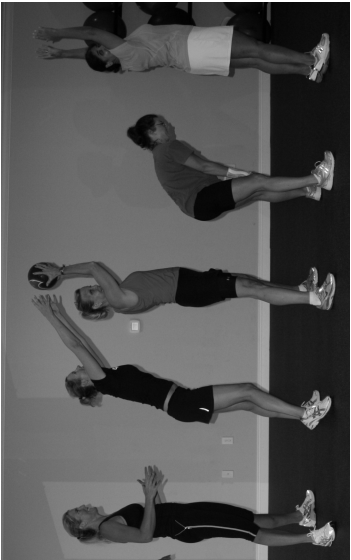


CENTER OF GRAVITY PARTNER/GROUP DRILLS

(Continued)

Exercise	Description	Exercise Image
Overhead Ball Pass Watch for hyperextension of the lower back	<p>Have clients stand in single file line.</p> <p>Client at front of line has ball. Client passes ball over head to client behind him. The ball is continuously passed until end of line. Ball is then passed back to the front of the line.</p>	
Ball Pass Between the Legs Bring the focus to the legs. Make sure knees are bent.	<p>Have clients stand in single file line.</p> <p>First person in line passes the ball between the legs to the person behind. Once the ball reaches the end of the line, clients pass ball forward.</p>	

CENTER OF GRAVITY PARTNER/GROUP DRILLS

(Continued)

Exercise	Description	Exercise Image
Alternate Overhead and Under the Legs	<p>First person in line passes ball overhead to the person standing behind him. That person passes the ball between the legs. Clients continue alternating passing the ball overhead and between legs until it reaches the end of the line. Repeat by passing the ball back to the front of the line.</p>	 
Ball Pass to the Side Watch for torque in the knee joint. Reach to give and receive the pass.	<p>Have clients stand in a circle and pass ball with both hands to the right. Once the ball has passed around the circle, change directions.</p>	 



REVIEW #12

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

- 1. What is the purpose of Center of Gravity Drills as they relate to functional training for Active Older Adults?**
- 2. Provide a list of Activities of Daily Living of Active Older Adults which require a strong Center of Gravity to avoid injury.**
- 3. What various pieces of Functional Training Equipment is recommended for performing Center of Gravity Drills?**
- 4. Provide examples of Activities of Daily Living not listed in this manual which are encountered by Active Older Adults that require a strong sense of Center of Gravity.**


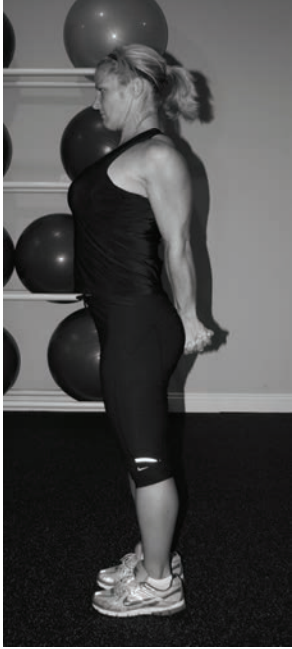
FLEXIBILITY TRAINING

As individuals age, joint range of motion and muscle flexibility gradually decline. Although declines in flexibility are inevitable with aging, studies have shown that a program which includes comprehensive flexibility training can assist with dynamic balance and functional mobility.

Stretches should be performed in a slow controlled manner and should be held for a total of 30 to 60 seconds.




General Rule of Thumb: *“if you worked it, you must stretch it”*

During the Flexibility Portion of the Training Session, you can choose to use exercises from the Warm-Up followed by specific flexibility work.

Exercise	Description	Exercise Image
Full Body Stretch Target Muscles: Fingers, Arms, Shoulders, Back and Abdominals	Stand with feet shoulder width apart. As you inhale, stretch arms overhead, reaching for the ceiling. Exhale while reaching the right arm as high as possible. Pause and reach the left arm as high as possible. Hold 15-30 seconds. Repeat 2 times.	
Chest Stretch Target Muscles: Deltoids Pectorals	Stand with feet shoulder width apart. Clasp hands together behind back. Keeping hands as close to body as possible, inhale. Exhale as you press hands down. Allow shoulder blades to depress and retract during the exhale. Hold 15-30 seconds. Repeat 2 times.	



FLEXIBILITY TRAINING

(Continued)

Exercise	Description	Exercise Image
Shoulder Stretch Target Muscles: Deltoids	Stand with arms out to sides. Slowly reach right arm across body, keeping arm as close to shoulder level as comfortable. Place left hand above or below the elbow. Inhale. Exhale as you gently press with the left hand. Hold 15-30 seconds. Repeat 2 times on each side.	
Wrist Circles Target Muscles: Forearms and Wrists	Extend arms to shoulder height. Slowly rotate wrists in clockwise direction 5-10 times. Reverse direction 5-10 times.	
Wrist Extensions Target Muscles: Forearms and Wrists	Extend arms to shoulder height. Alternate flexing and extending the wrists. Hold 15-30 seconds. Repeat 2 times with each hand.	



FLEXIBILITY TRAINING

(Continued)

Exercise	Description	Exercise Image
<p>Abductor Stretch</p> <p>Target Muscles: Abductors, Torso and Arms</p>	<p>Stand with right foot close to wall. Cross right foot behind left. Place arm on wall with fingers overhead and elbow close to ear. Lean slightly into the wall.</p> <p>Hold 15-30 seconds. Repeat 2 times on each side</p>	
<p>Hamstring Stretch</p> <p>Target Muscles: Hamstrings</p>	<p>Stand with right leg extended forward, heel on floor with toe lifted. Place hands on top of left thigh for support. Slowly lean forward from the hips while bending the left knee. Hold 15-30 seconds. Repeat 2 times on each side.</p>	

FLEXIBILITY TRAINING

(Continued)

Exercise	Description	Exercise Image
<p>Quadriceps/Hip Flexor Stretch</p> <p>Target Muscles: Quadriceps and Hip Flexors</p>	<p>Standing with right leg forward and left leg back, slightly bend left knee and press forward through the front of the left hip until a gentle stretch is felt in the front of the left thigh. Hold for 15-30 seconds. Repeat 2 times on each side.</p> <p>Note: If client has difficulty balancing, having client use the wall for balance.</p>	
<p>Calf Stretch</p> <p>Target Muscles: Gastrocnemius and Soleus</p>	<p>Standing with right leg forward and left leg back, press the left heel toward the floor, bending the left knee slightly until a gentle stretch is felt in the lower left leg. Hold 15-30 seconds. Repeat 2 times on each side.</p> <p>Note: Client can use the wall for balance if necessary</p>	



REVIEW #13

Below are a series of questions designed to help you remember the course material efficiently. Before proceeding to the next page of the course content, please answer the following questions.

- 1. True or False? With the aging process, there is a natural loss of joint range of motion and muscle flexibility.**
- 2. True or False? Studies have shown that a program that includes comprehensive flexibility training will assist with dynamic balance and functional mobility.**
- 3. What is the recommended length of time for stretches to be held in a Core & Functional Training Class/Session for Active Older Adults?**
- 4. The General Rule of Thumb of Flexibility is: “If you _____ it, you must _____ it.”**
- 5. Exercises from the _____ portion of the Class/Training Session can be used during the Flexibility portion.**

Example Active Older Adult Workout

EXERCISE	Reps/ Counts	Sets	Equipment
WARM-UP			
Neck Rolls	8	1	N/A
Overhead Stretch/Marching in Place	8	1	N/A
Arm Circles: Forward/Walking Forward	8	1	N/A
Arm Circles: Back/Walking Backward	8	1	N/A
Low Back	8	1	N/A
Step Touch:Shoulder Rolls Front/Back	16	2	N/A
Knee Ups	16	2	N/A
Ham Curls	16	2	N/A
MUSCLE STRENGTHENING			
Shoulder Shrugs with Hand Weights	10	2	Dumbbells
Standing Chest Press with Resistance Band	10	2	Resistance Band
Ball Lifts with Added Balance (seated on Stability Ball)	10	2	Medicine Ball and Stability Ball
Tricep Extensions with Added Balance (seated on Stability Ball)	10	2	Resistance Band and Stability Ball
Bicep Curls with One Leg Balance	10	2	Dumbbells
BALANCE DRILLS			
Vertical Arm Raises (seated on Stability Ball)	5	2	Stability Ball
Diagonal Arm Raises (seated on Stability Ball)	5	2	Stability Ball
Lateral Trunk Rotations (seated on Stability Ball)	5	2	Stability Ball
CENTER OF GRAVITY DRILLS			
Front Step Ups/Step Downs	8	2	Step
Side Step with Stork Balance	8	2	N/A
Overhead and Between the Legs Ball Pass	-	2	Medicine Ball
FLEXIBILITY/COOLDOWN			
Refer to Flexibility Exercises on Pages 48-49			

FiTOUR® Instructor Observation

Please contact a local health facility or fitness instructor so that you may arrange a time that is convenient for both to complete the observation. This observation will allow you to gain perspective as to the methods of teaching and instruction in a particular discipline. Please complete the form below while observing. **NOTE:** Please be sure to explain to the instructor that this observation will not be used for anything other than to aid in learning and that the observation sheet will not be viewed by one but yourself.

Instructor Name _____ Facility Name/Location _____

PERSONALITY		PREPARATION		TECHNIQUE		PARTICIPANTS	
Place a number from 1-5 in the box next to each below (5 being the highest rank)		Place a number from 1-5 in the box next to each below (5 being the highest rank)		Place a number from 1-5 in the box next to each below (5 being the highest rank)		Place a number from 1-5 in the box next to each below (5 being the highest rank)	
Positive personal hygiene		Time was used effectively		Exhibits positive reinforcement		Participants are enjoying the class	
Displays poise and Composure		Use of appropriate language		Appropriate voice projection		Participants are on task for majority of class	
Displays professional attitude		Evidence of planning/preparation		Utilizes "hands-on" teaching experiences		Participants ask questions/inquire	
Develops a rapport with participants		Room size/temperature was adequate		Proximity-changes places often to observe		Participants are serious about the class	
Creates a fun, safe and health beneficial atmosphere		Demonstrates proficient knowledge in subject area		Provides an atmosphere conducive to learning		Instructor communicates effectively with class	
Total		Total		Total		Total	

Total Score _____ out of 100%

Evaluation/Comments

FiTOUR®

BASIC EXERCISE SCIENCE

Theories & Applications

FiTOUR® recommends that all fitness professionals regularly review the basic exercise science theories and applications contained on the following pages.

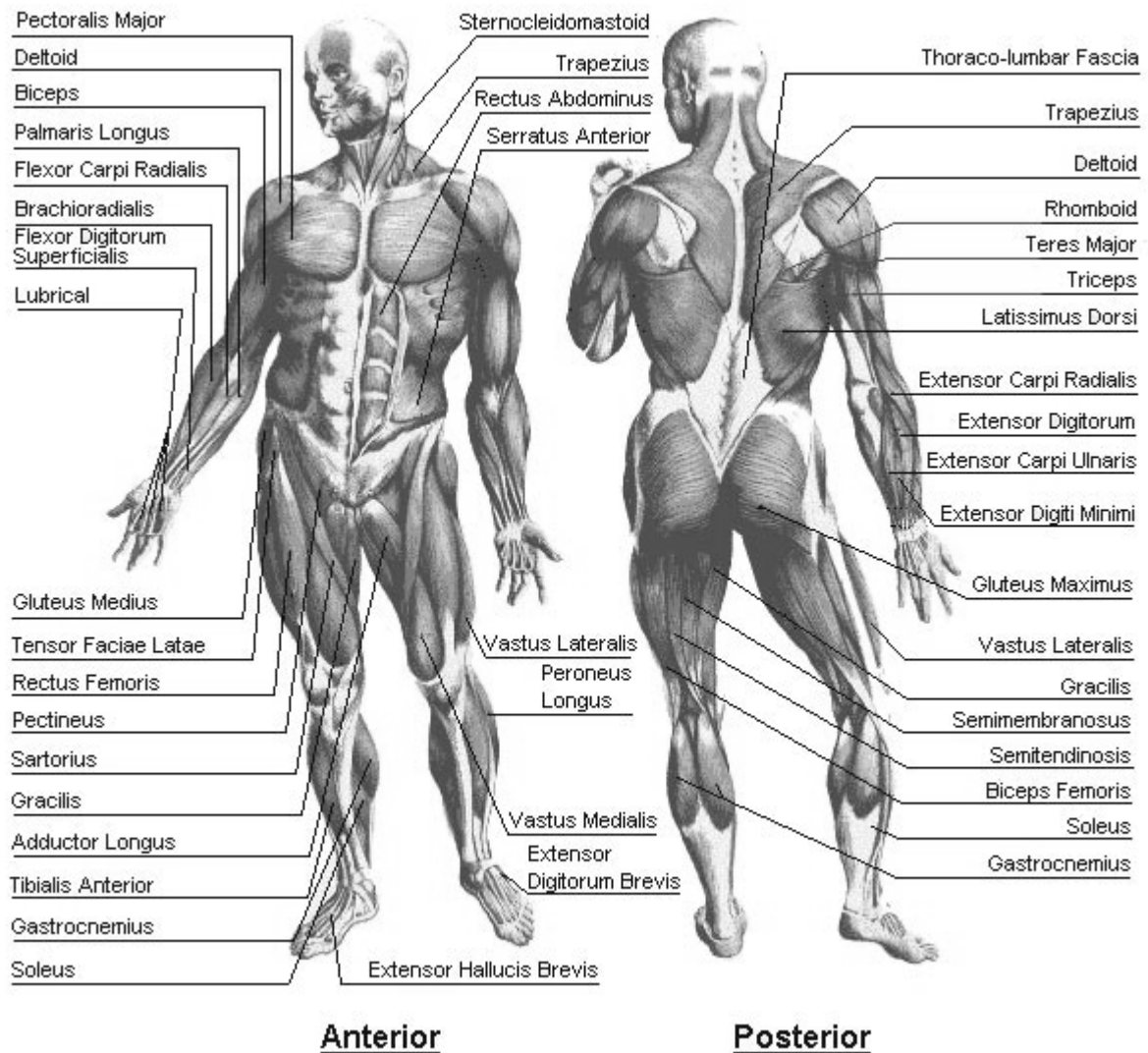
This information can be used as a reference.

This information is covered indepth in
FiTOUR® Primary Group Exercise Instructor
and FiTOUR® Primary Personal Trainer
Certification Programs.

Musculoskeletal Anatomy

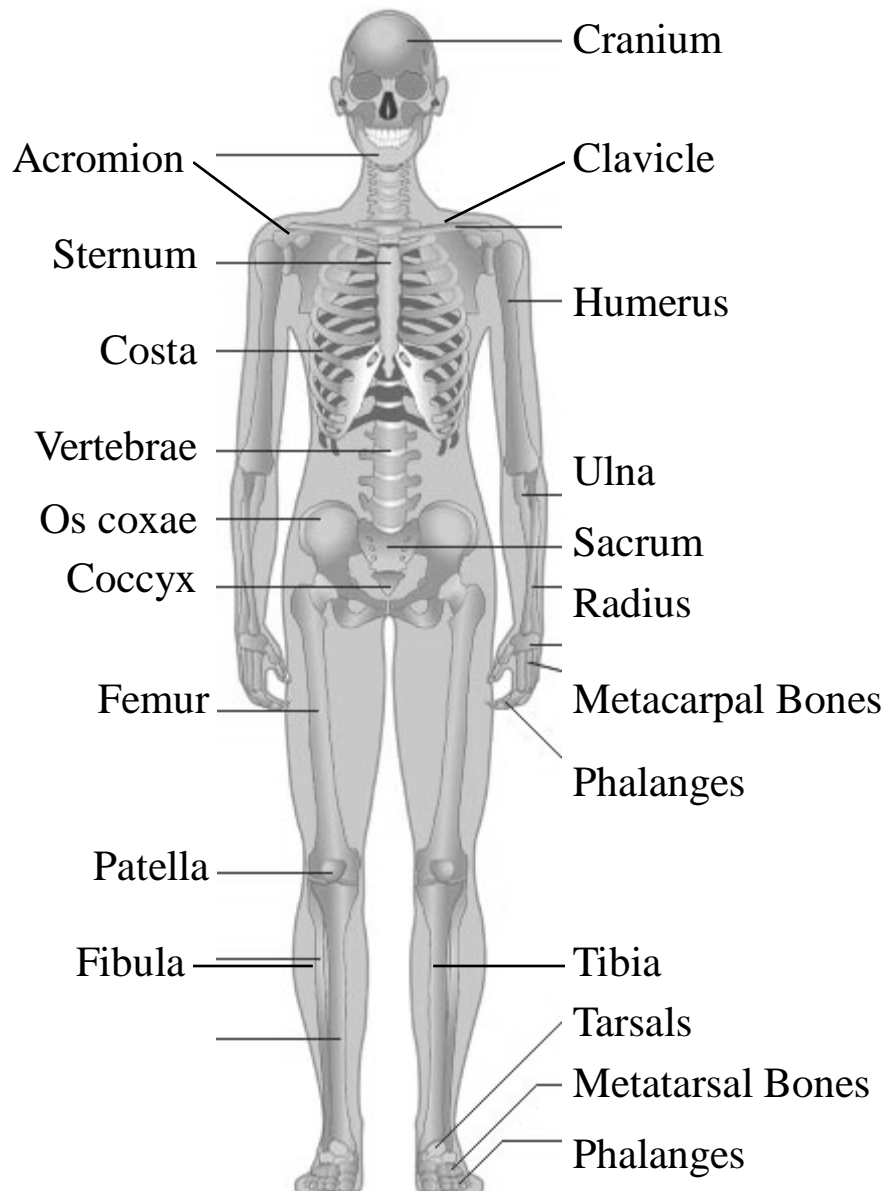
Anatomy Definition—The structure of the human body.

- **Striated or Skeletal Muscle:** The anatomical structure that provides the force necessary to move the body.
- **Myology:** The study of muscles



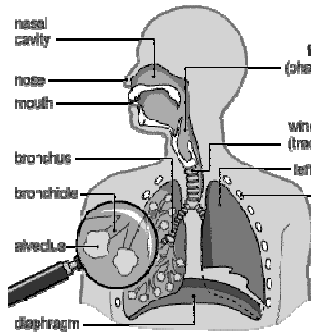
- **Bone:** The anatomical structure that provides support, movement, and protection for the body.
- **Osteology:** The study of bones

Skeletal Anatomical Figure



General Basic Physiology

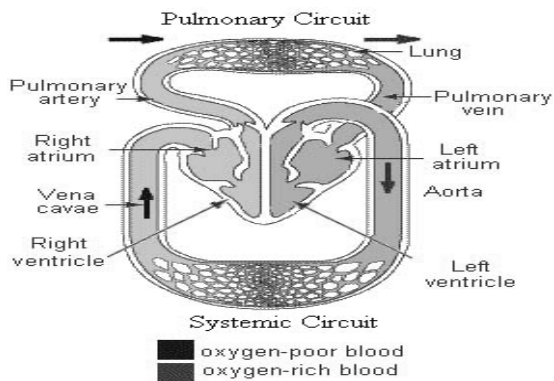
- **Definition:** Physiology is the study of human body function.
- **Cardiorespiratory/Cardiovascular Function**
 - Cardio– Heart
 - Respiratory– Lungs and Ventilation
 - Vascular– Blood Vessels
 - Definition: A health-related component of physical fitness that relates to the ability of the circulatory and respiratory systems to supply oxygen during physical activity.
 - Respiratory System: The primary function of the respiratory system is to supply the blood with oxygen in order for the blood to deliver oxygen to all parts of the body. The respiratory system does this through breathing. When we breathe, we inhale oxygen and exhale carbon dioxide. This exchange of gases is the respiratory system's means of getting oxygen to the blood. Respiration is achieved through the mouth, nose, trachea, lungs, and diaphragm.



Oxygen enters the respiratory system through the mouth and the nose. The oxygen then passes through the pharynx and the trachea which is a tube that enters the chest cavity. In the chest cavity, the trachea splits into two smaller tubes called the bronchi. Each bronchus then divides again forming the bronchial tubes. The bronchial tubes lead directly into the lungs where they divide into many smaller tubes which connect to tiny sacs called alveoli. The average adult's lungs contain about 600 million of these spongy, air-filled sacs that are surrounded by capillaries. The inhaled oxygen passes into the alveoli and then diffuses through the capillaries into the arterial blood. Meanwhile, the waste-rich blood from the veins releases its carbon dioxide into the alveoli. The carbon dioxide follows the same path out of the lungs when you exhale. The diaphragm's job is to help pump the carbon dioxide out of the lungs and pull the oxygen into the lungs. The diaphragm is a sheath of muscles that lies across the bottom of the chest cavity. As the diaphragm contracts and relaxes, breathing takes place. When the diaphragm contracts, oxygen is pulled into the lungs. When the diaphragm relaxes, carbon dioxide is pumped out of the lungs.

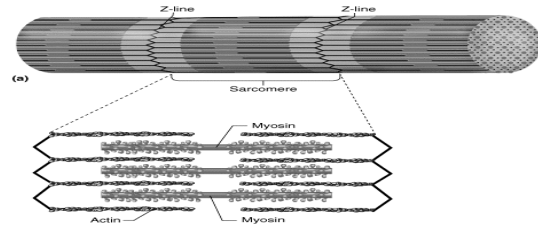
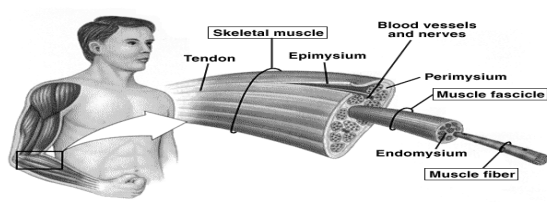


The cava is the vein that collects the blood returning from the upper body, and the inferior vena cava returns blood from the lower body. The deoxygenated blood of these two veins enters the heart in the right atrium and is pumped to the right ventricle. Then the blood travels out of the heart and enters the pulmonary artery. This artery carries the blood to the lungs to get oxygen. Once the blood reaches the lungs, carbon dioxide already in the blood is diffused into the lungs. Carbon dioxide is a cell's waste product after using oxygen. This is where the circulatory system and the respiratory system intertwine. The oxygen in the lungs is diffused through the alveoli sacs and then through the wall of the lungs into the bloodstream. The blood carries the oxygen to the various cells in the body. To get the oxygen to the actual cells, the arteries branch off into smaller arterioles. These even branch off to capillaries, the smallest of blood vessels. Their walls are extremely thin and elastic. In these vessels, the red blood cells must travel single file to pass through. The oxygen diffuses across the capillary wall. It then travels to a nearby cell and enters through the cell membrane. The carbon dioxide that leaves the cell to allow room for the oxygen makes its way to the bloodstream. Once it reaches the capillaries, it has entered the bloodstream. The capillaries then fork into venules, which then fork into veins. The veins carry the carbon dioxide in the blood back to the heart. This completes the cycle of the circulatory system.



- Cardiovascular System: The cardiovascular system is a complex system with one central organ: the heart. The heart is the body's pace-maker. It pumps oxygen-rich blood to the different parts of the body. The blood's journey through the body is an extensive trip through highways of veins, arteries, and other branches. The heart is divided into four chambers: the left (LA) and right atria (RA), and the left (LV) and right ventricle (RV). The atria are on the upper half of the heart, and the ventricles make up the lower portion. The object of the blood is to circulate oxygen for the growth and development of cells.

- Cardiorespiratory System: Blood enters the heart in the left atrium, from the superior and inferior vena cava. The superior vena cava is the vein that collects the blood returning from the upper body, and the inferior vena cava returns blood from the lower body. The deoxygenated blood of these two veins enters the heart in the right atrium and is pumped to the right ventricle. Then the blood travels out of the heart and enters the pulmonary artery. This artery carries the blood to the lungs to get oxygen. Once the blood reaches the lungs, carbon dioxide already in the blood is diffused into the lungs. Carbon dioxide is a cell's waste product after using oxygen. This is where the circulatory system and the respiratory system intertwine. The oxygen in the lungs is diffused through the alveoli sacs and then through the wall of the lungs into the bloodstream. The blood carries the oxygen to the various cells in the body. To get the oxygen to the actual cells, the arteries branch off into smaller arterioles. These even branch off to capillaries, the smallest of blood vessels. Their walls are extremely thin and elastic. In these vessels, the red blood cells must travel single file to pass through. The oxygen diffuses across the capillary wall. It then travels to a nearby cell and enters through the cell membrane. The carbon dioxide that leaves the cell to allow room for the oxygen makes its way to the bloodstream. Once it reaches the capillaries, it has entered the bloodstream. The capillaries then fork into venules, which then fork into veins. The veins carry the carbon dioxide in the blood back to the heart. This completes the cycle of the circulatory system.

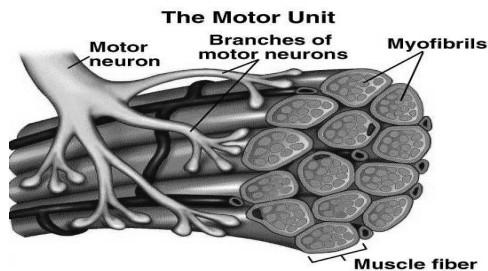


Muscles

- 3 Types
 - Smooth (Involuntary)
 - Cardiac (Involuntary)
 - **Skeletal/Striated (Voluntary):** About 400
- Muscle

(Fasciculus– A bundle of muscle fibers surrounded by perimysium)

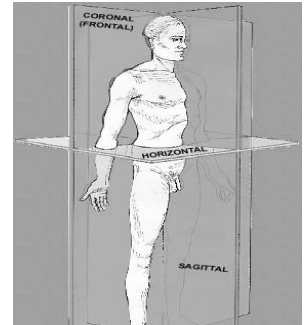
 - Muscle Fiber
 - Myofibril
 - Sarcomere: Fundamental Unit of Contraction
 - Actin - Thin Filament
 - Myosin - Thick Filament



Motor Unit: The functional unit of muscular contraction that includes a motor nerve and the muscle fiber that its branches innervate.

Kinesiology/Biomechanics

- **Definition:** Kinesiology is the scientific study of human movement.
 - **Planes of Movement:** Flat imaginary surfaces that divide the body into halves in order to correspond with movement, motion, and actions. Human movement occurs in a plane.
 - Median/Sagittal Plane: A vertical plane that passes through the body anterior to posterior dividing the body into right and left sections. Flexion and extension actions occur within the sagittal plane.
 - Frontal/Coronal Plane: A vertical plane that passes through the body from side to side dividing the body into anterior and posterior sections. Abduction and adduction actions occur within the frontal plane.
 - Transverse/Horizontal Plane: A horizontal plane that passes through the body dividing the body into superior and inferior sections. Rotation and twisting actions occur within the transverse/horizontal plane.
 - Oblique Plane: A plane that lies tilted among the 3 primary planes associated with kinesiology.
- *Movement within a plane will always occur parallel to that plane.



- **Muscle Movement/Action**
 - **Prime Movers (Agonist):** Muscles responsible for a definite movement of a joint.
 - **Antagonist:** Muscles that cause movement at a joint in a direction opposite to that of its agonist.
 - **Synergists:** Muscles that keep the joint steady while the prime mover applies force to a neighboring
- **Joint Actions (Joint=a point where two bones articulate)**
 - Flexion: The movement of a limb caused by concentric muscular contraction, resulting in a decrease in the angle of a joint.
 - Extension: Increasing the angle of a joint.
 - Hyperextension: A continuation of extension past the normal anatomical position.
 - Lateral Flexion: Flexing to the side (Usually an action of the vertebral column)
 - Dorsiflexion: Flexion of the ankle joint bringing the top of the foot towards the shin
 - Plantar Flexion: Extension of the ankle joint lowering the top of the foot away from the shin. The bottom of the foot lowers towards the floor.
 - Abduction: Within the anatomical position, movement of a bone laterally away from the midline of the body.
 - Adduction: Within the anatomical position, movement of a bone towards the midline of the body.
 - Rotation: Movement around an axis
 - Internal Rotation: Rotation of a joint inward towards the midline of the body.
 - External Rotation: Rotation of a joint outwards away from the midline of the body.
 - Circumduction: A stationary point on a line with the distal end moving in a circle forming a cone. This is a combination of movements in all planes.
 - Elevation: Upward movement/action of the scapula
 - Depression: Downward movement/action of the scapula
 - Protraction: Abduction of the scapula
 - Retraction: Adduction of the scapula
 - Pronation (eversion): The position of the hand with the palm facing down. The inward rotational roll position of the foot.
 - Supination (inversion): The position of the hand with the palm facing up. The outward rotational roll position of the foot.
 - Neutral Spine: The natural inward arch of the low back which distributes load equally throughout the low back. This distribution of load helps to prevent injury and allows for efficient movement.
 - Anterior Tilt: An arching of the lower back that causes the pelvis to tilt towards the front of the body.
 - Posterior Tilt: A rounding of the lower back that causes the pelvis to tilt towards the back of the body.
- **Anatomical Locations Terminology**
 - Anterior: In front or in front of the body
 - Deep: below the surface and not relatively close to the surface.
 - Distal: Situated away from the center or midline of the body, or from the point of origin
 - Inferior (Infra): Below in relation to another structure, lower
 - Lateral: On or to the side, outside, farther from the median or midsagittal plane
 - Medial: Relating to the middle or center, nearer to the medial or midsagittal plane
 - Midline: An imaginary external vertical line which is used as a reference line to divide the body or body parts into left and right sections
 - Posterior: Behind or in back (rear) of the body
 - Proximal: Nearest the trunk or the point of origin
 - Superior (Supra): Above in relation to another structure, higher

General Training Concepts and Terms

- Acclimatization: A physiological adaptation to a new environment (higher altitude, temperature, or humidity). It may take 7 to 12 days to acclimate to different environments.
- Adherence: A state of continuing an exercise program as prescribed.
- Aerobic Activities: Sub-maximal intense activities that use large muscle groups with energy supplied in the presence of oxygen that can be performed for a long period of time.
- Agility: Ability to start, stop, and move the body quickly in different directions.
- Anaerobic Activities: High intensity activities during which energy demands exceed the ability to supply oxygen and cannot be performed for a long period of time.
- Balance: The ability to maintain a certain posture or to move without falling; symmetrical.
- Conditioning: Exercise conducted on a regular basis over a period of time ("training").
- Coordination: The ability to perform a task integrating movements of the body.
- Cross Training: Incorporating different modalities of exercise into one's overall training regimen to avoid over-training, boredom, and/or plateau.
- Delayed Onset of Muscle Soreness (DOMS): Muscle soreness that occurs 1-2 days after an exercise training session.
- Efficiency: The ratio of energy expenditure to work output. How well an individual can perform or execute an exercise.
- Fartlek (Speed Play): A form of physical conditioning which alternates fast and slow running over varied terrain for 3-4 miles.
- Force: Any push or pull that tends to cause movement
- Interval Training: A fitness workout that alternates harder and lighter bouts of intensities throughout the session
- Overload Principle: To place greater than usual demands upon some part of the body.
- Periodization: A specific period of time (weeks, months, or years) over which the frequency, volume, and intensity of training are systematically varied to avoid over-training and to promote continued progress.
- Plyometrics: A method of resistance training that emphasizes the stretching of the muscle prior to the contraction.

- Power: The ability to exert muscular strength quickly.
Expressed as $\text{Force} \times \text{Speed} = \text{Power}$
- Progressive Overload Principle: Introducing overloads in a systematic manner.
- Rest: One must plan days of rest to yield an improvement in one's overall performance
 - Active Rest– Days that consist of light, fun activities different from one's normal workout program
 - Passive Rest– Days that consist of doing no activity.
- Reversibility: A marked decrease in endurance, muscular strength, and flexibility with the cessation of exercise
 - Muscular Strength– Begins to reduce after 72 hours of cessation
 - Cardiovascular Endurance– Begins to reduce after 2 weeks of cessation
- Specificity Concept: The idea that one should train in a specific manner to achieve a specific outcome.
- Speed: The ability to move the body quickly.
- Training Effect: Overall positive improvements in the performance of the heart, lungs, and muscles due to conditioning.
- Training Variation: Systematically manipulating training variables to create an overload thereby demanding the body to adapt and improve.

General Exercise Guidelines

- **FITT Principle:** The 4 principles involved in all progressive exercise programs.
 - Frequency: How often one exercises during the week or the number of exercise sessions during a week.
 - Intensity: How hard one works during an exercise session.
 - Time (Duration): The length of the exercise session.
 - Type: The modality of exercise being executed.
- **ACSM Guidelines and the FITT Principle**
 - Cardiovascular (Aerobic) Training
 - Frequency: 3-5 Days a Week
 - Intensity
 - Guidelines for Monitoring Intensity (*See also* next page)
 - 60%-90% of MHR (Age Predicted Maximum Heart Rate)
 - 50%-85% of VO₂max or HRR (Heart Rate Reserve)
 - Time
 - 20-60 minutes of continuous vigorous activity
 - When just beginning, do as much as you can
 - 1996 Surgeon General's Report— Accumulate 30 minutes of vigorous activity throughout the day for health purposes.
 - Resistance Training
 - Frequency: Minimum 2 days/week
 - Intensity: 8-10 Major Muscles
 - Time: 8-12 Reps/1-2 Sets
 - For continued muscular development increase to 3 sets and heavier load
 - Flexibility
 - Frequency: At least 3 days/week or after every workout
 - Intensity: Stretch all major muscles to the point of mild discomfort
 - Time: Hold each stretch 15-30 seconds/Repeat each stretch 3-5 sets
- **General Safety Tips**
 - Always consult a physician before beginning a new exercise program.
 - Warmup and Cooldown before and after every workout.
 - Use proper posture.
 - Use proper exercise form.
 - Breathe properly. Never hold breath. Inhale to prepare. Exhale to execute a movement.
 - Avoid exercising in extreme temperatures (hot or cold) and humidity.
 - Take days off during the week to rest and repair the body.
 - Wear proper clothing and footwear.
 - Drink water before, during, and after exercise.
 - Maintain heart rate within the target heart rate during exercise.
 - If one has a special health condition, take medication as prescribed by his/her physician.
 - Warning Signs to Discontinue Exercise and Seek Medical Advice
 - Labored breathing (Difficulty breathing not associated with regular increased ventilation during exercise)
 - Loss of coordination
 - Dizziness
 - Tightness in chest
- **Injury Prevention and Management**
 - Prevention
 - Increase training gradually.
 - Alternate more aggressive training days with less aggressive training days.
 - Get plenty of sleep.
 - Eat a healthy diet.
 - Make adjustments to training program when needed.
 - Avoid over-training—a condition in which there is a plateau or drop in performance over a period of time. This condition occurs when there is not sufficient time for the body to recover after a workout session.
 - Warning Signs—Extreme soreness and stiffness after training, irritableness, decrease in body weight, decrease in appetite, lack of motivation, and unable to complete a training session.
 - Management
 - RICE/MS—If one is injured implement basic first aid until medical professionals take over.
 - Rest
 - Ice
 - Compression
 - Elevate
 - Modality—Change activity until healed
 - Stabilize—immediately stabilize an injured joint prior to moving or placing pressure on the joint.

- **Special Populations**
 - **Older Adults**
 - Choose a modality that does not impose significant orthopedic stress.
 - The activity should be convenient and fun—stressing social aspects.
 - Emphasize programs that will enhance functional strength and flexibility thereby enhancing one's ability to lead an independent lifestyle.
 - Incorporate cardio activity.
 - Incorporate resistance training that focuses on muscular health and endurance emphasizing all major muscle groups.
 - Incorporate a flexibility program.
 - **Youth**
 - Incorporate consistent but fun exercise program.
 - Children are more apt to adapt to a cardio exercise program that emulates the way children play. For example, intermittent bouts of cardio activity within a session models how children play tag.
 - Incorporate a light resistance training program that incorporates tubing or light weights that will elicit a rep range of about 20. Limit resistance training to 2 days a week.
 - Incorporate a flexibility program.
 - Teach proper eating habits.
 - Use multi-joint rather than single-joint exercises.
 - Children overheat much faster and are more prone to heat injuries than adults.
 - **Athletes**
 - Provide a variety of activities that offer a challenge.
 - Incorporate plyometric moves and interval training.
 - Incorporate games.
 - **Obesity**
 - Encourage a complete program of diet and exercise for weight loss.
 - Place importance on health as opposed to physical appearance.
 - Exercise 3-5 days/week.
 - Exercise for longer durations at a lower intensity.
 - Avoid high impact moves.
 - Wear protective footwear.
 - Water exercise is excellent for a combination of cardio and resistance training.
 - **Pregnant Women**
 - Discuss first with the physician an exercise plan of action.
 - Exercise 3 days a week.
 - Perform a longer warm-up (10-15 minutes).
 - Avoid overheating.
 - Use the talk test or RPE scale to monitor intensity.
 - Aqua aerobics is recommended with pool temperature between 80-84°.
 - Drink water before, during, and after exercise.
 - Avoid exercising to exhaustion.
 - If one feels uncomfortable with exercises while lying on the back, choose a different exercise. Throughout the workout, take small breaks from exercises that require a supine position.
 - As part of the muscle conditioning, perform Kegel exercises.
 - Avoid deep stretches.
 - Consume 300 more kcals a day.
 - **Asthma**
 - Exercise Induced Asthma— A condition that occurs when an individual breathes large volumes of dry air that cools and dries the respiratory tract. This causes the airway to constrict making it difficult to receive oxygen.
 - Avoid exercise in a cold, dry environment.
 - One may choose an aquatic exercise program. The warm, humid air in an aquatic setting makes it easier for one to breathe.
 - Perform a longer warm-up.
 - Interval training is optimal.
 - Avoid eating at least 2 hours prior to exercise.
 - Take prescribed medication prior to exercise.
 - Have a bronchodilator on hand.
 - Exercise with a buddy in case of an incident.
 - **Hypertension/Cardiac/Stroke Rehab Released Clients**
 - Only those who have been released by their doctors should participate in a group exercise class format.
 - Exercise 3-5 days/week.
 - Perform a longer warm-up.
 - Emphasize large muscle dynamic movement done at moderate intensities (40-60% of MHR or RPE= 10-12) for long durations.
 - Avoid interval training.
 - Avoid raising the arms overhead for an extended period of time.
 - If an individual complains of pain or pressure in the chest or feels dizzy, he/she should stop exercising and contact his/her doctor.
 - Avoid Valsalva Maneuver: Increased pressure in the abdominal and thoracic cavities caused by breath holding and extreme effort.
 - Encourage those who are prescribed medications to take them on a regular basis.

- **Arthritis**
 - Avoid exercise when the joint is inflamed.
 - Avoid exercise in the morning. This is when an individual has the least amount of mobility.
 - Perform a longer warm-up to increase the viscosity of the joints due to synovial fluid being released.
 - Move all joints through full range of motion including fingers and toes.
 - Perform exercises gently with little to no bounding.
 - These individuals should consider an aqua exercise program, keeping the water temperature between 86-90°
 - Incorporate a well-rounded exercise program that includes cardio, resistance training, and flexibility.
- **Osteoporosis**
 - A disease characterized by a decrease in the total amount of bone mineral and a decrease in the strength of the remaining bone.
 - A water exercise program that strengthens bones and the ligaments and tendons around the joints for stability is an excellent class format for these individuals.
- **Knee/Hip Problems**
 - Incorporate resistance training to strengthen the ligaments and tendons that support the knee and hip.
 - Keep the movements fluid; avoid jerky, rushed movement.
 - Avoid twisting while keep the feet planted on the floor.
 - Keep knees flexed.
 - Individuals with hip replacement should avoid crossing one leg over the other. Avoid hip flexion beyond 90°.
- **Low Back Problems**
 - Avoid bounding movements.
 - Avoid hyperextension of the lower back.
 - Strengthen abdominals.
 - Develop core strength.
 - Maintain neutral spine.
 - Stop if an exercise is painful.
 - Teach client proper lifting techniques.
- **Diabetes**
 - Type I Diabetes– A metabolic disorder characterized by inability to oxidize carbohydrates because of inadequate insulin. (Insulin Dependent)
 - Accounts for 10% of all diabetics.
 - If blood glucose is below 80-100 mg/dl, one should consume carbohydrates before exercising.
 - If blood glucose is above 250 mg/dl, one should delay exercise until the glucose is lowered.
 - One should not exercise during peak insulin action. One should avoid injecting insulin into the working muscles and instead inject insulin into a skinfold.
 - One should consume additional carbohydrates after exercise.
 - Type II Diabetes– A metabolic disorder characterized by inability to oxidize carbohydrates because of a resistance to insulin. (Noninsulin Dependent)
 - Adult Onset
 - Individuals with Type II Diabetes usually have other conditions such as obesity, high blood pressure, and high cholesterol.
 - Can be controlled with diet and exercise. Individuals may take oral medication.
 - Exercise Guidelines (set by The American Diabetes Association)
 - Participants should drink water before, during, and after exercise
 - Participants should plan insulin injections in conjunction with the exercise session.
 - Participants should wear protective footwear.
 - Avoid extreme heat and cold environments.
 - Exercise at a steady pace, about 50-70% of VO₂ MAX or HRR. Avoid interval workouts.
 - Exercise with a buddy in case hypoglycemia or hyperglycemia occurs.
 - Have easily digestible carbohydrates on hand in case of a drop in glucose.

Five Components of Fitness

1. Cardiorespiratory Fitness (CRF)- A measure of the heart's ability to pump oxygen-rich blood to the working muscles

- Cardio– Heart
- Respiratory– Lungs and Ventilation
- Vascular– Blood Vessels
- Aerobic– Working with Oxygen
- Anaerobic– Working without Oxygen
- Measurement of Cardiorespiratory Fitness
 - 3-minute step test
 - 1.5 Mile Walk/Run

2. Muscular Endurance– The ability of a muscle to perform repetitive contractions over a period of time or the ability to sustain an amount of weight over a period of time.

- Abdominal Curl-up Test
- Push Up Test

3. Muscular Strength– The ability of a muscle to generate the maximum amount of force in a single effort.

- Measurement
 - 1 Repetition Maximum (1RM) Test (Bench Press/Leg Press)
 - Vertical Jump Test
 - Dynamometer Test (Grip Test)

4. Flexibility– The ability to move a joint through a full range of motion without discomfort or pain.

- Measurement
 - Sit and Reach Test
 - Shoulder Reach Flexibility Test

5. Body Composition– Relative percentages of various components of the body, usually divided into fat mass (% of body fat) and fat free or lean mass (% fat free mass).

- Fat Mass– Subcutaneous Adipose Tissue
- Lean Mass– Muscles, bones, blood, organs, skin, hair, teeth, etc.
- Measurement
 - Hydrostatic Underwater Weighing– Gold Standard
 - Skinfold Calipers
 - Infrared
 - Bioelectrical Impedance
- Body Fat Standards for Active Individuals
 - Women–
 - Essential to live 8-12%
 - Minimal 10-12%
 - Athletic 12-22%
 - Recommended <34 years 20-35%
 - Recommended 35-55 years 23-38%
 - Recommended >56 years 25-38%
 - Men–
 - Essential to live 3-5%
 - Minimal 5%
 - Athletic 5-13%
 - Recommended <34 years 8-22%
 - Recommended 35-55 years 10-25%
 - Recommended >56 years 10-25%

*All percentages higher than recommended categorizes one as obese.

References

- A.C.S.M. *Guidelines for Exercise Testing and Prescription 7th Edition*. Lead & Febiger: Philadelphia, PA, 2005.
- A.C.S.M *Resource Manual for Guidelines for Exercise Testing and Prescription 6th Edition*. Lippincott, Williams & Wilkins, MD, 2010
- Baechle, T. R. and Groves, B. R. *Weight Training: Steps to Success*. Human Kinetics: Champaign, IL, 1998.
- Baker, C. *Total Core Strength on the Ball*. Thunder Bay Press: San Diego, CA 2004
- Boyle, M. *Functional Training for Sports*. Human Kinetics: Champaign, IL 2004.
- Bryant, Cedric X. *101 Frequently asked questions about "Health and Fitness" and "Nutrition & Weight Control"*. Sagamore Publishing, 1999
- Delavier, F. *Strength Training Anatomy*. Human Kinetics: Champaign, IL, 2001.
- Franks, B. D. and Howley, E. T. *Fitness Leader's Handbook*. Human Kinetics: Champaign, IL, 1998.
- Franks, B. D., and Howley, E. T. *Health Fitness Instructor's Handbook*. Human Kinetics: Champaign, IL, 1992.
- Golding, L. A., Myers, C. R., Sinning, W. E. *Y's Way to Physical Fitness*. Human Kinetics: Champaign, IL, 1989.
- Holland, W. H., MacBeth, J. L., Whaley, M. H. *Fundamental Kinesiology Made Plain and Simple*. William Harold Holland: Murfreesboro, TN, 1995.
- Jemmett, R. *The Athlete's Ball*. Novont Health Publishing Limited: Halifax, Canada, 2004.
- Jespersen, M. and Potvin, A.N. *The Great Body Ball Handbook*. Productive Fitness Products Inc.; Surrey, B.C., Canada, 2005.
- Kendall, F., McCreary, E., Provance, P., Rodgers, M., Romai, W. *Muscles: Testing and Function with Posture and Pain* (5th ed.). Lippincott Williams & Williams: Philadelphia, PA, 2005.
- LeUnes, A. D. and Nation, J. R. *Sport Psychology: An Introduction*. Nelson-Hall: Chicago, IL, 1989.
- Muller-Wohlfahrt, H. W. and Montag, H. J. *Injured...What Now?* Hastings House: Norwalk, Connecticut, 1999.
- NSCA-Essentials of Strength Training and Conditioning 2nd Edition*. Baechle & Earle. IL, 2000
- Potvin, A.N. and Benson, C. *The Great Balance & Stability Handbook*. Productive Fitness Products Inc.; Surrey, B.C., Canada, 2003.
- Verstegen, M. and Williams, P. *Core Performance*. Rodale: New York, 2004.
- Yoke, M. M. and Kennedy, C. *Functional Exercise Progressions*. Healthy Learning: Monterey, CA, 2004.
- Rose, Debra J. *Fall Proof! A Comprehensive Balance and Mobility Training Program*. Human Kinetics: Champaign, IL, 2003
- Brill, Patricia A. *Functional Fitness for Older Adults*, Human Kinetics: Champaign, IL, 2004

<http://www.brianmac.co.uk/reaction.htm>

<http://www.wikipedia.org>

<http://sportsmedicine.about.com/od/abdominalcorestrength1/a/NewCore.htm>

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Two course required program which includes the FiTOUR® Group Exercise certification course and any other FiTOUR® certification program. The FiTOUR® Specialist will be achieved when one has completed the FiTOUR® Group Exercise certification course AND the course of your chosen discipline. The FiTOUR® Specialist programs are available in all courses offered at FiTOUR®. The FiTOUR® Specialist program develops learning through a progression of two required courses.

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The FiTOUR® MASTER Practitioner program is for any fitness instructor or trainer looking to advance their knowledge while simultaneously creating a marketing edge for themselves as a serious professional. The FiTOUR® MASTER Practitioner program is the highest level certification available and is clearly a mark of distinction. Become a FiTOUR® MASTER Practitioner in many different disciplines. The FiTOUR® MASTER Practitioner program is an advanced level fitness certification program that develops learning through a progression of four required courses.

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FiTOUR® is dedicated to providing fitness professionals with high quality, convenient fitness education. Because many of the existing fitness organizations have raised the CEC requirements required for renewal, it has become increasingly financially difficult to maintain certifications. FiTOUR® has designed a unique renewal program that will decrease the financial commitment and is unlike any other in the industry.

Unique Renewal System

FREE Continuing Education Credits! Simply complete a 25 question renewal examination and receive a FREE CEC certificate for that exam!

The renewal fee is only \$25 for any FiTOUR® certification!

The certification is valid for two years from the date issued on the certificate!

Renewal Fees

Each FiTOUR® certification is valid for two years from the date issued and can be renewed online at www.FiTOUR.com anytime within 90 days of the expiration date. The renewal fee is \$25 for each FiTOUR® certification.

About the Renewal Examination

The certification renewal examination consists of 25 questions that are derived from the original certification examination. Please reference your FiTOUR® certification study material prior to completion of the renewal examination. If the minimum score of 75% is not achieved on the renewal examination, a retest is available at a fee of \$25 each. You may re-test as many times as necessary.

How to Renew a FiTOUR® Certification

Login to the Exam Center located at www.FiTOUR.com within 90 days of the expiration date. Certifications will not be eligible for renewal until 90 days prior to the expiration date.

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