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Contents

Motivation and Goal Setting

➢ Three Types of Motivation

- **Intrinsic Motivation:**
  - Emerges from positive self-concept
  - Most ideal form of energy used
    - *Intrinsically motivated individuals are competent and take pride in mastering a task or being successful in accomplishing a goal.*

- **Extrinsic Motivation:**
  - Comes from an outside source. For example, working out compulsively to avoid negative effect of being out of shape and overweight.
  - The focus is on the outcome instead of the process of achievement.
    - *Extrinsically motivated individuals need to be encouraged to change their focus from looking a certain way to enjoying the positive benefits of exercise which, in turn, will result in improved appearance as well as improved fitness.*

- **Amotivation:**
  - A state in which there is a complete absence of motivation.

➢ Goal Setting

To effect change, it is important for a client to identify specific goals and for the trainer to understand those specific goals. While a client may have a vague sense of specific goals, he/she may not be able to adequately voice those goals to the trainer. This is especially true if the client and trainer have just met and are beginning a new relationship. The client may be anxious or nervous and may be reluctant to voice actual issues that may need to be addressed before embarking on reaching specific goals.

Asking the client to complete a **Goal Setting Questionnaire** can be helpful in identifying his/her individual **degree of satisfaction with current level of** fitness and **areas of improvement**. The information obtained through completion of the questionnaire will provide the trainer with insight into the client as an individual and will help the trainer better devise a plan with the best approach to the client's success in obtaining the set goals.

Goal Setting Questionnaire

DEGREE of SATISFACTION with Current Level of Fitness *Check the best number for each aspect of your current fitness level, using this scale:* *4 = Very Satisfied 3 = Satisfied 2 = Dissatisfied 1 = Very Dissatisfied*	**4**	**3**	**2**	**1**
Amount of Energy				
Cardiovascular Endurance				
Muscular Strength and Endurance				
Flexibility of Hamstrings and Low Back				
Ability to Cope with Tension and Stress				
Ability to Relax				
Ability to Get a Good Night's Rest				
Low Back Function				
Physical Appearance/Body Weight				

AREAS of IMPROVEMENT

Take a few moments to think about the areas of your life which you feel need improvement. Briefly list areas of improvement below.

1. Specific Physical Problem:

2. Appearance of Particular Part of Body:

3. Ability to Participate in a Specific Sport (e.g., tennis, skiing, running)

4. Risk of a Health Problem:

5. Other:

➢ Transtheoretical Model of Behavior Change

To be an effective and successful personal trainer, it is important to understand the basics involved in behavior change and the skills needed to motivate change. Change is not instantaneous but a process which occurs through different stages over a time. Behavior is learned and can be changed when bad habits are identified and the consequences of not changing are understood.

Three Dimensions of the Transtheoretical Model of Change: In order to assist a client in making changes, it is important to evaluate the client with respect to these three dimensions. Having the client complete a **Plan of Change** will identify specific habit patterns that create roadblocks to the client's success:

Dimension 1 - Stages of Change:

#1 Precontemplation – In this stage, the client can be in denial that change is necessary or not have seriously thought about making any lifestyle changes in the next six months.

Trainer's goal in this stage is to get people thinking about making lifestyle changes to include increased physical activity.

#2 Contemplation – Client is seriously considering making lifestyle changes within the next six months.

Trainer's goal in this stage is to prepare client to take action by providing information on how to be more active.

#3 Preparation – This is transitional stage from Contemplation to planning and preparing to make lifestyle changes within the next month.

Trainer's goal is to assist in resolving barriers that may be in the way of adopting physical activity by setting goals and providing a fitness program.

#4 Action – Occurs six months *after* client makes changes to lifestyle. This is the least stable stage of change and drop-out during this stage is highest.

Because this stage has the highest risk of drop-out, it is important for the trainer to use strategies to decrease the risk of drop-out. The trainer and client should work together to identify situations which may put the client at risk of drop-out. After a situation is identified, develop a strategy to avoid or overcome the situation.

#5 Maintenance – After the client has maintained healthy lifestyle changes for over six months, there is less chance of drop-out. The longer a client maintains healthy lifestyle changes, the less risk of drop-out**.**

Once a client has moved from the action stage into the maintenance stage, incorporate strategies to encourage maintenance. These strategies can include reevaluation of goals and providing advice on how to handle circumstances which may get in the way of exercise such as travel, illness or family/work responsibilities.

PLAN OF CHANGE
Identify Habit Patterns That Create Roadblocks

1. Food Choices

2. Exercise Choices

3. Unhealthy or Negative Thoughts

4. Unhealthy or Negative Behaviors (smoking, alcohol, drug abuse, caffeine, diet sodas, etc.)

5. Daily Activities/Habits: Briefly examine the activities of a typical day. List each activity and the time you generally participate in that activity.

AM:

Mid-AM:

Noon:

Mid-Afternoon:

Early PM:

Late PM:

After a Plan of Change has been set in place, it needs to be understood that changes in behavior will not automatically occur.

Dimension 2 - Attitudes, Beliefs and Behavior Skills Which Influence Behavior Change:

Self-efficacy – Confidently adopting positive behavior and avoiding undesired behavior.

Decisional balance – Weighing the pros and cons when making choices regarding healthy lifestyle

Process of change – Experientially and cognitively using thoughts, attitudes and awareness to elicit change by gaining knowledge of how to make changes (experiential and cognitive) and then setting forth a plan to change (behavioral)

> ***Example:*** *Reading literature on the benefits of walking for weight loss is a cognitive process, and setting reminders on calendar is a behavioral process both of which will bring about change.*

Dimension 3 - Level of Change:

What is the root of the problem? There are more problems than can possibly be listed. Question client to determine root of problem and then work with client to find a solution to the problem.

> ***Problem:*** *Time*
> ***Solution:*** *30 minute training session*
>
> ***Problem****: Money*
> ***Solution****: Consultation sessions once every 4-6 weeks for a workout to do alone*
> *Follow-up consultations to re-assess and assign new program every 4-6 weeks*
>
> ***Problem****: Spouse/Family*
> ***Solution****: Explain to spouse/family that adopting a healthy lifestyle will make you a better parent and spouse.*

A personal trainer with the correct tools and approach can be an integral part in a client making lifelong changes in behavior that may be detrimental to their health and may ultimately keep them from reaching their fitness goals. While total change may not occur in a specific or set amount of time, the foundation for change can be set.

➢ Three Basic Psychological Needs

As clients find these three basic psychological needs fulfilled, they will be able to achieve goals more readily because they will be more confident in their success.

Autonomy: Freedom of choice

Many people are motivated to exercise to enhance their body image and may feel pressured to exercise rather than exercising because they enjoy physical activity.

The trainer can assist the client in moving from extrinsic behavior to intrinsic behavior by focusing on the things the client enjoys about exercising. Giving clients a level of autonomy as it relates to training sessions and program design can achieve this.

- Offer choices of various types of exercises and activities. Ask these simple questions:
  - What exercises do you enjoy?
  - Are there exercises to which you are indifferent?
  - What exercises do you dislike?
  - Steer clear of the exercises that are not enjoyed and include the exercises that are enjoyed.

- Change their definition of exercise.
  - All types of physical activity are exercise. Personal training is about diversity. Personal training can be found in the yoga or Pilates studio, the pool, the home, a park, a tennis court or soccer field – the possibilities are endless.
  - Create a program around an activity or hobby the client enjoys.

Competence: Self-perception of ability to perform well in an activity

The trainer can use feedback to boost a client's confidence which will in turn boost competence.

- Positive Reinforcement – Use general reinforcement once or twice during a training session. Continuous use of reinforcement can seem insincere. Some examples of positive reinforcement are "Good job!" or "You're doing great!".

- Skill-Specific – When a client performs a new skill or a difficult skill, provide skill-specific feedback the first few times a client is able to perform a skill successfully or with improvement.

Relatedness: Sense of shared experience

- Take the time to get to know your clients and their personalities
    - Do you like being talked to during a training session?
    - Do you want trainer to count repetitions for you or do you prefer to count your own repetitions?

- Genuinely care about your clients
    - Be a good listener
    - Be sensitive to your clients' moods and adjust accordingly
    - Avoid "I's" and "me's" during a training session. This is your client's time and the focus should be on the client, not the trainer.

Asking clients to complete a Behavioral Change Contract after goals have been set and a plan of change has been identified is an ideal method of encouraging compliance with the personal training program which will ultimately result in the client's success. The sample Behavioral Change Contract on the following page can be copied or adapted for use.

For the most positive effect and outcome, the trainer should be present as the client reads and completes the Behavioral Change Contract. The trainer may actually read each step on the contract as the client completes the contract or have the client read the contract aloud as he/she completes the contract. The trainer being actively involved in the client's completion of the contract can create a bond between the trainer and client which can reinforce positive behavior toward successful completion of the set goals.

Upon review of the client's completed Behavioral Change Contract, the trainer should refer back to the Transtheoretical Model of Change. Relate the completed contract to the three dimensions of the Transtheoretical Model of Change by reviewing the contract with an eye toward:

1. The client's current level in the stages of change (Dimension #1);

2. The client's attitudes, beliefs and behavior skills which influence change (Dimension #2) and;

3. Identify problems or roadblocks to effecting change (Dimension #3).

BEHAVIORAL CHANGE CONTRACT

I _____(client) do agree that I will adhere to the suggested exercise and diet guidelines as set forth by _____ (trainer):

1. I will attend all scheduled Personal Training Sessions at _____am/pm on _____ day(s) for _____ weeks beginning on _____, 20___ and ending on _____, 20___.

2. I will keep a daily journal in which I record daily exercise activities.

3. I will keep a daily journal in which I record food and calorie consumption.

4. I commit to having positive thoughts and engaging in positive behaviors.

5. I commit to letting go of habit patterns that are unhealthy and negative and that have kept me from successfully reaching my goals in the past.

6. I commit to forming new habit patterns that are healthy and positive to replace the old habit patterns in a constant effort to improve the areas of my life that I identified as needing improvement.

7. I commit to advising _____ (trainer) of any injury or illness I experience.

8. I commit to asking for modified exercises if the execution of an exercise being performed during any training sessions results in pain or feels as if it could cause injury.

9. I commit to taking each day one at a time and to making positive changes every day.

10. At the conclusion of the time period listed above, I commit to adopting and maintaining all of the positive changes and new habit patterns formed during the training program.

Signed _____ Date _____

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

Section #1 Review Questions

1. Define and explain intrinsic motivation:

2. Define and explain extrinsic motivation:

3. Define and explain amotivation:

4. What is the benefit of having a client complete a goal setting questionnaire?

5. What are the three dimensions of behavioral change?

Exercise Psychology and Behavioral Science

➢ Definitions:

Physical Activity – Any bodily movement produced by the skeletal muscles resulting in an expenditure of energy. This bodily movement can be an organized exercise method or as simple as a mother running around after her children.

Exercise – A subset of physical activity that is characterized by planned, organized, and repetitive components aimed at improving or maintaining physical fitness.

Physical Fitness – A set of attributes that are either health or skill related.

➢ Physical Benefits of Physical Fitness

1. Increased blood flow to the heart
2. Lowered blood pressure
3. Lowered cholesterol
4. Increased lung capacity
5. More efficient delivery of oxygenated blood to all parts of the body
6. Control of hypertension
7. Control of diabetes
8. Control of osteoporosis
9. Weight control
10. Increased muscle mass
11. Increased metabolism
12. Lowered resting heart rate

➢ Psychological Benefits of Physical Fitness

1. Anxiety and stress reduction
2. Socialization
3. Ageless confidence
4. Thrill of competition for those who enjoy competition

➢ Exercise Adherence and Compliance

1. The inability to maintain an exercise regimen is one of the more perplexing problems facing professionals in various health-related enterprises.
2. Fifty percent of all who start a fitness campaign will drop out in six months or less.

Positive Predictors of Exercise Adherence

1. Physical proximity to the exercise area
2. Spousal or significant other support
3. Exercising in small groups as opposed to large groups
4. Socioeconomic status
5. Intrinsic motivation

Negative Predictors of Exercise Adherence

1. Lack of time
2. Accessibility
3. Smoking
4. Poor choice of mode of exercise
5. Injury
6. Type A personalities going too hard too soon

Improving Exercise Adherence

1. Agreement to a Behavioral Change Contract between personal trainer and client
2. Maintain objective records of exercise regimen
3. Stimulus Cueing - Exercising using the same activity at the same time and place every day
4. Set and record goals
5. Reinforcement and reward for meeting goals
6. Begin an exercise program with low intensity and gradually progress

➢ Effects of Exercise on Mood

1. Exercise and Anxiety
    - Research supports the conclusion that exercise reduces anxiety in individuals.
2. Exercise and Depression
    - Depression Defined: Characterized by withdrawal, inactivity, and feelings of hopelessness and loss of control.
    - Exercise has become a therapeutic intervention in depression.
    - Running has received the most recognition in treating depression.

➢ Overtraining Syndrome *(See Page 34)*

➢ Body Image/Obsessive Compulsive Disorder (OCD)

As a personal trainer, one should be aware of common body image and eating disorders that may arise within the client. The personal trainer should not diagnose these disorders, but may refer his/her client to a specialist.

Definition of Body Image: Theoretically defined as how one views one's body and how one believes others view one's body. Some individuals have an extremely distorted body image which can drive one to be obsessive about working out.

Definition of Obsessive Compulsive Disorder (OCD): Some clients may become overzealous and work out too much which can lead to overuse injuries. The individual may have a latent problem such as OCD. This disorder can be defined theoretically as having unwanted ideas or impulses that repeatedly consume one's mind. Working out could potentially become addicting whether it be positive or negative.

Definition of Body Dysmorphic Disorder (BDD): The preoccupation with an imagined or slight defect with a specific body part, e.g., nose, hair, or skin.

➢ Common Eating Disorders

- **Anorexia Nervosa:** Refusal to maintain normal body weight even though grossly underweight
- **Bulimia:** An act of binge eating and purging to gain a sense of control over weight or other issues in one's life

➢ Muscle Dysmorphia (Reverse Anorexia)

- Muscle Dysmorphia (MD) is a subtype of BDD that is characterized by the preoccupation of one's overall body. One with MD has a distorted body image that is opposite of one with anorexia. One with MD sees a very underweight body and works out continuously to get more and more muscular. This disorder may also be the cause of anabolic steroid use.
    - The person has a preoccupation with the idea that one's body is not sufficiently lean and muscular leading to excessive weight lifting and dieting.
    - The primary focus of the preoccupation and behaviors is on being too small or inadequately muscular as opposed to the fear of being fat (anorexia nervosa) or the preoccupation with only one body part (BDD).
    - The preoccupation causes significant distress in social, occupational, or other areas as demonstrated by at least two of the following criteria.
        - The individual gives up social, occupational or recreational activities because of the need to maintain workout and diet regimen.
        - The individual avoids or markedly endures situations in which his/her body is exposed.
        - The preoccupation about the insufficient muscularity is clinically distressful in social and occupational functions.
        - The individual continues to exercise, diet or use ergogenic substances despite physiological or psychological affects

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

Section #2 Review Questions

1. Name five benefits of physical fitness:

2. Can exercise have an effect on mood?

3. Define muscle dysmorphia:

4. Define body image:

5. Define body dysmorphic disorder:

6. Define obsessive compulsive disorder:

Advance Functional and Fitness Performance Assessment Record

This form can be used to record a client's performance during advanced functional and fitness performance. By maintaining and recording assessment scores, a client's progress can be easily tracked and adjustments can be made to a program to continue to improve performance. This form may be copied or adapted from the "Forms" section in the back of this manual.

TEST	SCORE	RETEST SCORE
Functional Strength Tests		
Total Leg Strength Test		
Hamstring/Quadriceps Strength Test		
Bench Press		
Functional Flexibility Tests		
Sock Test		
Fingertip-to-Floor Test		
Muscle Coordination - Ball Toss Test		
Muscle Balance/Imbalances Tests		
Dynamic Measurement		
Static Measurement: The Stork Test		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		

Advanced Functional Assessments

➢ Functional Strength

Definition: Training the body to better perform movements of everyday living

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 to change a light bulb
4. Power: Walking uphill
5. Combinations of the above or similar activities of daily living

Exercise Equipment for Functional Strength Exercises

1. Dumbbells
2. Barbells
3. Elastic or rubberized resistance equipment
4. Exercise balls
5. Medicine balls
6. Steps
7. Body weight

Example Functional Strength Exercises:

These exercises challenge the whole body to control and balance the weight in three-dimensional space, rather than letting the machines do the work.

1. Walking lunges with dumbbells
2. Squats with a barbell
3. Swimming using the elastic tubing or bands
4. Abdominal crunches on an exercise ball
5. Passing a medicine ball while doing abdominal crunches
6. Step-ups on a step or bench
7. Dips using body weight

Testing for Functional Strength:

A speed strength imbalance between two opposing muscle groups may be a limiting factor in the development of speed. Muscle balance testing to compare the strength of opposing muscle groups is important to prevent injury and guarantee maximum speed of muscle contraction and relaxation. Muscle imbalance can slow you down and result in injury.

Lower Body Functional Strength Tests

Leg press/body weight ratio: Leg strength/body weight ratio indicates how easily an individual can get and keep the body moving at high speeds. This ratio is important to speed improvements in short distances. A good ratio is 2.5:1 or a leg press score of two and half times body weight. If it is less than 2.5, consider modifying the program to develop leg strength.

1. **Total Leg Strength:** The squat is considered the most functional leg strength test in predicting sprinting and jumping ability. Good 1RM/One Rep Max (see below to determine 1RM) scores are:
    - Male athletes 2 X "Body weight"
    - Female athletes 1.5 X "Body weight"

2. **Hamstring/Quadriceps Strength:** For each leg, record the 1RM for the leg curl and leg extension exercises. Divide the leg extension score by the leg curl score to find the ratio for each leg. For each leg the curl score should be at least 80% of the leg extension score. If the score is less than 80%, devote more training attention to the hamstrings. To reduce the chance of injury the ratio should be at least 75%.

Upper Body Functional Strength Tests

1. **Bench Press** – This is a test for upper body strength. The need for maximum upper body strength varies between sports and so it does not always need to be tested. Good 1RM (see below to determine 1RM) scores are:
    - Male athletes 1.25 x "Body weight"
    - Female athletes 0.8 x "Body weight"

Balance Check:

Once functional strength has been tested, check for muscle balance in each limb. (See Page 19)

Determining 1RM:

If one needs to determine maximum load (1RM) for a weight training exercise then there is a way of obtaining an approximate value based on a weight and the number of repetitions one can perform to exhaustion for that exercise. The following equations provide a good estimate of the maximum load providing the number of repetitions does not exceed 12.

Brzycki Equation: Weight ÷ (1.0278 - (0.0278 x number of repetitions)) = 1RM
Alternate Equation: Weight x (1 + (0.033 x number of repetitions)) = 1RM

➢ Functional Flexibility

Definition: The ability of the individual parts of the skeleton to easily, freely, and fluidly float through full range of motion without discomfort or pain

Myth #1: *One needs to stretch into contorting positions like practiced in yoga in order to be functionally flexible.*
Truth: *Contortion ability comes from over-stretching tendons across joints or hyper-loosening specific joints. Over-stretching tendons and hyper-loosening joints through extreme contortion is not necessary for achieving Functional Flexibility, and is to be avoided, as it can cause or increase the risk of injury.*

Myth #2: *One should obtain functional flexibility through conventional stretches.*
Truth: *Conventional stretching is linear and isolated in nature because individual muscles are addressed on a single plane. One should work dehydrated, disorganized tissue with a three-dimensional movement of the bone it connects and the joints and hinges it crosses. Comprehensive and systematic skeletal range of motion movements will improve and develop functional flexibility.*

Example Functional Flexibility Exercises:

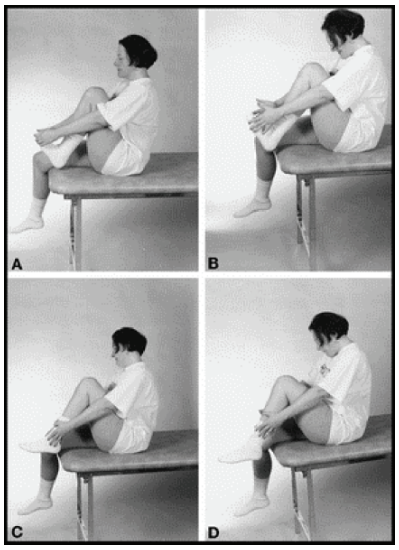
The exercises listed below challenge the whole body to maneuver in three-dimensional space rather than stretching in one linear plane of movement.

1. Flexing and releasing muscles with a foam roller (abductor muscles are an example)
2. Flexing and releasing muscles with exercise tubing or a rubber band
3. Flexing and releasing muscles with the assistance of a towel or strap
4. Pilates full range of motion type movements
5. Tai Chi exercises

Testing for Functional Flexibility:

1. **The Sock Test:** The Sock Test simulates the activity of putting on a sock. The test is standardized and does not allow alternative ways of moving. The personal trainer evaluates the client's performance, observing how far the patient reaches and how easily the activity is done. The client should wear loose clothing. The activity is first demonstrated to the client. The client is then instructed to sit on a high bench, with the feet not touching the floor. The client lifts up one leg at a time in the sagittal plane and simultaneously reaches down toward the lifted foot with both hands, one on each side, grabbing the toes with the fingertips of both hands. The foot must not touch the bench and should be in the air at all times during the test. After testing each leg once, the client is given a score on the most limited performance. Scores are given as ordinal values from 0 (can grab the toes with fingertips and perform the action with ease) to 3 (can hardly, if at all, reach as far as the ankle joint) (Fig. 1). Several compensation maneuvers might be demonstrated. Compensations are not scored. If they occur, the test is explained or demonstrated to the patient again before the test is repeated. Examples of compensating include 1) abducting the leg/knee out to the side to reach the toes and 2) pulling the leg up close to the body to touch the toes.

Figure 1.



Score	Description of Function
Figure 1.A **Score 0**	Client can grab toes with fingertips and perform the action with ease.
Figure 1.A **Score 0**	Client can grab toes with fingertips but performs the action with effort.
Figure 1.C **Score 2**	Client can reach beyond the ankle joint, but cannot reach the toes.
Figure 1.D **Score 3**	Client can hardly reach, if at all, as far as the ankle joint.

2. **Fingertip-to-Floor Flexibility Measurement:** The measurement of the fingertip-to-floor distance is compared with the normal distance of 20 centimeters or less. One simply bends from the hips and extends the fingertips to the floor. If he/she is 20 centimeters or less from the floor, he/she is considered normal in functional flexibility. The goal of a personal trainer is to work with a client in functional flexibility to where he/she will be able to touch the floor with the fingertips.

➢ Muscle Coordination

Definition: 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.

Coordination is dependent on the interaction of multiple body organs and systems including the eyes, ears, brain and nervous system, cardiovascular system, and muscles. Testing or examination of any or all of these organs or systems may be necessary to determine the causes of loss of balance, dizziness, or the inability to coordinate movement or activities.

Coordination is influenced by the genetic makeup of individual, as well as the individual's imagination, acquired skills and experience. During human development, coordination improves along with the state of nervous system.

Measurement:

1. **Ball Toss** – Coordination is typically assessed using measures of hand-eye or foot-eye coordination such as juggling, dribbling a ball or hitting an object. There are, however, many different types of coordination and total assessment of coordination would require many different tests.

    - **Equipment Required:** Flat wall and a ball about the size of a tennis ball.
    - **Procedure:** Client should stand about five feet away from the wall. Throw the ball underhandedly with the right hand against the wall and catch the ball with the left hand. Throw the ball against the wall with the left hand and catch the ball with the right hand. Repeat this throwing pattern for two minutes.
    - **Results:** This exercise will become easier as hand-eye coordination improves.

➢ Muscle Balance/Imbalances

Definition: The relationship between the tone or strength and length of the muscles around a joint is known as muscle balance. When examining a client, the personal trainer should assess stationary and dynamic strength and length. Muscles can be divided into two types: mobilizers and stabilizers. These two groups of muscles have quite different characteristics.

Mobilizers: 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, in contrast to mobilizers, 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 with 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 muscle "imbalance". Detection of this muscle “imbalance” can assist the personal trainer in assisting a client in reversing and correcting muscle 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.

Measurement:

1. **Dynamic Measurement** (See Functional Strength Measurement Page 15)**:** A speed strength imbalance between two opposing muscle groups may be a limiting factor in the development of speed. Muscle balance testing to compare the strength of opposing muscle groups is important to prevent injury and guarantee maximum speed of muscle contraction and relaxation. Muscle imbalance inhibits speed and causes injury.

   After testing for Functional Strength, perform a balance check for the below muscle groups for each side of the body.

   For each of the following exercises listed below, the right and left limb 1RM scores should not differ by more than 10%.
   - Hamstrings (leg curl)
   - Quadriceps (leg extension)
   - Arm curl
   - One arm military press

2. **Static Measurement:** The Stork Test

   - **Procedure:** The Stork Test monitors the development of ability to maintain a state of equilibrium (balance) in a static position. Have the client stand comfortably on both feet and place hands on hips, lift one leg and place the toes of that foot against the knee of the standing leg. The personal trainer directs the client to raise the heel of the standing foot and stand on the toes. The personal trainer starts the stopwatch. The client balances on one foot for as long as possible without letting either the heel touch the floor or the other foot move away from the knee of the standing leg. The personal trainer records the time for which the client balanced. Repeat on the other leg
   - **Equipment Required:** Warm and dry area (like a gym), stopwatch
   - **Results:** The table below gives rating scores for the test.

Excellent	Above Average	Average	Below Average	Poor
> 50 Secs	40-49 Secs	26-39 Secs	11-25 Secs	< 11 Secs

3. **Isokinetic Muscle/Joint Imbalance Testing:** To truly test the imbalances of joints and muscles, one can use specialized Isokinetic machines. For supplemental information, the below chart gives specific agonist and antagonist joint movements that can be tested for imbalances. Where there is an imbalance, then the personal trainer and client need to devote more training attention to the muscle group of the weaker limb. Isokinetic imbalance testing is generally limited to specialized facilities that have the specialized equipment on site (i.e., rehabilitation and hospital facilities).

Joint	Joint
Ankle	Plantar Flexion/Dorsi Flexion
Ankle	Inversion/Eversion
Leg	Extension/Flexion
Hip	Extension/Flexion

Joint	Movement
Shoulder	Flexion/Extension
Elbow	Flexion/Extension
Lumbar	Flexion/Extension

4. **Postural Inspection:** A number of tests are available to assess muscle imbalance including postural inspection. Inspection of posture provides a quick screen.

Muscle	Sign of Lengthening or Inhibition
Transverse abdominus	Navel out
Serratus anterior	Winging scapulae
Lower trapezius	Elevated shoulder girdle
Deep neck flexors	Forward head when viewed from the side
Gluteus medius	Unleveled pelvis with one leg standing
Gluteus maximus	Sagging buttocks

➢ Postural Alignment

Definition: 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. In other words, 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. There is an optimum length at which the muscle is capable of developing maximal tension. By assessing one's posture, muscle imbalances can be determined.

➢ Postural Misalignments

Hyperlordosis or Swayback

Definition: There is an extreme arch in the lower back area of the body. This usually means the back is tight and the abdominals are weak.

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

Kyphosis

Definition: Convex curvature of the spine which results in the shoulders rounding forward and the buttocks tucking under. The upper back is usually weak and the chest is tight.

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

Flat Back

Definition: The spine is completely straight with no normal curvature.

Correction: Perform functional core and lower back exercises.

Supination

Definition: The feet roll outward causing pain in joints and shins.

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

Pronation

Definition: The feet roll inward (flat feet) and the knees tend to collapse inward. This rolling inward usually means tight posterior muscles and iliotibial band.

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

Hyperextended Knees

Definition: A condition in which 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 from a side view, the leg looks as though it bends backward.

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

Quick Assessment Questionnaire of Client's Posture

While working with a client ask yourself the following questions regarding your client's posture.

- Front Assessment
  1. Does client's head tilt to one side?
  2. Are the shoulders level?
  3. Are the hips level?
  4. Are the feet flat causing the knees to collapse?

- Side Assessment
  1. Does the head jut forward?
  2. Do the shoulders round or slouch forward?
  3. Does the pelvis tilt forward or backwards causing excessive curvature or rounding of the lower back respectively?

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

Section #3 Review Questions

1. Briefly list and explain the categories of functional strength:

2. List three examples of functional strength exercises:

3. What is a method of testing lower body functional strength?

4. Define functional flexibility:

5. Define muscle coordination:

6. Explain how to quickly perform both a front and side assessment of a client's posture.

Fitness Performance Components and Measurement

Once an individual has developed a foundational fitness level through a basic six-week comprehensive fitness program that targets the basic five components of fitness (cardiorespiratory fitness, muscular strength, muscular endurance, flexibility, and body composition), the personal trainer can begin to implement more advance training that targets one's fitness performance. The five Fitness Performance Components include agility, speed, power, reaction time, and skill.

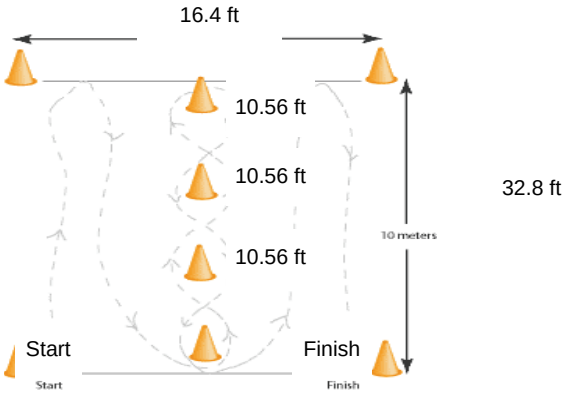
➢ Agility

Definition: The ability to start, stop, and move the body quickly in different directions

Measurement:

The Illinois Agility Test

- **Diagram:**



- **Description and Set Up:** The length of the course is 10 meters (32.8 feet) and the width (distance between the start and finish points) is 5 meters (16.4 feet). Four cones are used to mark the start, finish and the two turning points. Another four cones are placed down the center an equal distance apart. Each cone in the center is spaced 3.3 meters (10.56 feet) apart.

- **Procedure:** Subjects should lie on their front (head to the start line) with hands by their shoulders. On the 'Go' command the stopwatch is started, and the athlete gets up as quickly as possible and runs around the course in the direction indicated, without knocking the cones over, to the finish line, at which the timing is stopped.

- **Equipment Required:** Flat non-slip surface, cones, stopwatch, measuring tape

- **Results:** The table below gives rating scores for the test.

Agility Run Ratings (Seconds)					
	Excellent	**Good**	**Average**	**Fair**	**Poor**
Males	<15.2	16.1-15.2	18.1-16.2	18.3-18.2	>18.3
Females	<17.0	17.9-17.0	21.7-18.0	23.0-21.8	>23.0

➢ Speed

Definition: The ability to move the body quickly or the velocity at which one moves

Measurement:

30m Sprint (98.4 ft)

- **Description and Set Up:** This test measures the ability to accelerate to full speed quickly, as well as reaction time. Warm up thoroughly before you begin with a few minutes of light jogging and major muscle group stretches. Avoid training the day before, especially heavy weight training which will have a significant effect on the results. Set up 2 cones 30m (98.4 ft) apart and start at one cone.

- **Procedures:** On a signal of "Marks - Set - GO" sprint to the other cone as quickly as possible. Have a training partner record your time with a stopwatch. Perform three trials and take the best time.

- **Equipment Required:** Flat non-slip surface, cones, stopwatch, measuring tape

- **Results:** Any time less than five seconds is good; less than four seconds is excellent.

➢ Power

Definition: The ability to exert muscular strength quickly

The product of speed and force (Speed X Force = Power). Force—any push or pull that tends to cause movement.

Measurement:

Standing Long Jump (Explosive Power)

- **Description and Set Up:** This test measures one's explosive power. Warm up thoroughly before you begin with a few minutes of light jogging and major muscle group stretches. Avoid training the day before, especially heavy weight training which will have a significant effect on the results.

  Make a mark on the ground.

- **Procedures:** Stand at a mark with your feet slightly apart. Taking off and landing with both feet, swing your arms and bend the knees to jump forward as far as possible. Measure the distance, rest fully and repeat three times. Take the longest of the three trials as your score.

- **Equipment Required:** Flat non-slip surface and measuring tape

- **Results:** The table below gives rating scores for the test.

Standing Long Jump Test					
	Poor	**Below Average**	**Average**	**Good**	**Excellent**
Males	<2.0m	2.3m	2.5m	2.7m	>3.0m
Females	<1.7m	1.9m	2.2m	2.5m	>2.8

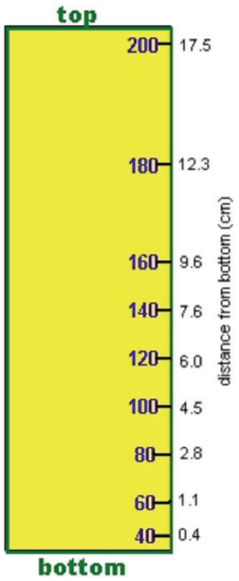
➢ Reaction Time

Definition: The ability to respond quickly to stimuli. When the body or brain is stimulated, the stimuli are 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.

Reaction time is important in many sports and day-to-day activities, though it is not often measured. As with all sports fitness testing, specificity is very important, and if you were to seriously want to measure an athlete's reaction time in a certain sport, you would want a test that is more specific to the visual cues and muscle reactions that are encountered during that sport.

Measurement:

Dropped Ruler Test (*This test is for fun!)*



- **Equipment Required:**
  - A piece of thick paper or cardboard, approximately 20cm long and 5cm wide
  - A ruler
  - A pen or pencil

- **Description and Set Up:** *(Construction Method)*
  - Cut the card to at least 20cm long and 5cm wide (see figure on right)
  - Mark the piece of paper or cardboard as illustrated
  - The numbers 40 to 200 (time in milliseconds) are to be written on the card at the specified distances (in cm) from the bottom of the card
  - Note: all measurements are approximate

- **Procedures:**
  - The personal trainer holds the reaction timer at the top
  - The client lines up the fingers with the bottom edge of the reaction timer
  - The personal trainer drops the reaction timer at any time, without warning. The client tries to grab the timer between the fingers. The client should not chase it, that is cheating.

- **Results:**

Speed (Milliseconds)	Rating
40	Great—Very Fast
60	Good—Fast
80	Above Average
120	Average

Speed (Milliseconds)	Rating
140	Slow
160	Very Slow
180	Try Again
200	Wake UP!!!

➢ Skill

Definition: An ability 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. When we choose to move, the action is controlled by the conscious brain using a collection of learned movements. For the movement to progress successfully, the client requires information feedback.

Types of Skills: Although there are different types of skills including cognitive and perceptual, the types of skill addressed here are motor and motor perceptual.

- Motor Skill - Movement and muscle control
- Motor Perceptual - Involves the 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. E.g., running drills are used to develop important components of proper and economical running technique. Whichever drills are used they must be correct for the required action.

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

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

Section #4 Review Questions

1. Define agility:

2. Briefly list and explain the agility run ratings:

3. Define speed:

4. Explain how to perform the test to measure power:

5. Briefly explain the differences between two types of skills—(1) Motor Skill and (2) Motor Perceptual.

Advanced Weight Lifting Programming

In the FiTOUR® Primary Personal Trainer Certification, the goal of resistance training was to develop a muscular strength and endurance foundation for the client by developing a basic six-week resistance program. The following information relates to the client who has established a foundational resistance program. This information can be used to customize a weight lifting program to achieve specific goals.

Weight Training Variables

1. Load: The amount of weight being lifted sometimes a percentage of one's 1RM
2. Rep: The execution of an exercise one time
3. Set: The number of repetitions consecutively performed in an exercise without rest

The 3 Main Weight Training Goals

1. To develop muscular endurance
2. To develop muscular hypertrophy
3. To develop muscular strength

Muscular Endurance Weight Training Program

- **Muscular endurance defined:** The capacity of a muscle to repeatedly contract over a period of time without undue fatigue
- Example athletes: Runner, triathlete, and swimmer
- Relative weight loading: Light
- % of 1RM: 60%-70%
- Rep range: 12-20
- # of sets: 2-3
- Rest between sets: 20-30 seconds

Muscular Hypertrophy Weight Training Program

- **Muscular hypertrophy defined:** Muscles that are cut, defined, and are large in size. Muscle capacity that is in between muscular endurance and muscular strength.
- Example athlete: Bodybuilder
- Relative weight loading: Moderate
- % of 1RM: 70%-80%
- Rep range: 8-12
- # of sets: 3-6
- Rest between sets: 30-90 seconds

Muscular Strength Weight Training Program

- **Muscular strength defined:** The ability of a muscle to exert maximal force in a single effort
- Example athletes: Power lifter and football player
- Relative weight loading: Heavy
- % of 1RM: 80%-100%
- Rep range: 1-8
- # of sets: 3-5 or more
- Rest between sets: 2-5 minutes

Determining 1RM: Choose a load and lift it as many times as possible, but do not exceed 12 reps

- Brzycki Equation: Weight (load) ÷ (1.0278 - (0.0278 X number of repetitions)) = 1RM
- Alternate Equation: Weight (load) X (1 + (0.033 X number of repetitions)) = 1RM

➢ Specialized Weight Training Programs

Super Set Training

- Defined: Consecutively performing two exercises that train opposing muscle groups without rest between them
- Goal achieved: Muscular hypertrophy

Compound Set Training

- Defined: Performing two different exercises that work the same muscle group consecutively, without rest between them. For example: performing one set of machine bench presses and then performing one set dumbbell flys
- Goal achieved: Muscular hypertrophy

Pyramid Training

- Defined: A method of multi-set training in which loads get progressively heavier or lighter in between sets of the same exercise. As the load increases, the reps decrease.
- Goal achieved: Muscular strength

Multiple Sets-Same Load Training

- Defined: Performing an exercise more than one set of the same load. The percentage of 1RM is relative to the rep goal.
    - 80% of 1RM/8 Reps
    - 85% of 1RM/6 Reps
    - 90% of 1RM/4 Reps
    - 95% of 1RM/2 Reps
- Goal achieved: Muscular strength

➢ Training Frequency

Three Days a Week Program: All exercises working all muscle groups are performed 3 days a week resting for 48 hours in between workout days. Example Routine: Monday, Wednesday, Friday/ Tuesday, Thursday, Saturday/ Sunday, Tuesday, Thursday

Four Days a Week Split Program:

- A more advanced training program.
- Split 1st half of workout routine and perform on two days of the week.
- Split 2nd half of workout routine and perform on two other days of the week.
- Usually involves more exercises.
- Example weekly routine #1:
    - Upper Body Exercises Monday/Thursday
    - Lower Body Exercises Tuesday/Friday
- Example weekly routine #2
    - Chest, Shoulders, Arms - Monday/Thursday
    - Legs and Back - Tuesday/Friday

➢ Arranging Exercises within a Training Session

- **Muscle Balance:** Pair up exercises that work opposing muscle groups to create balance within a workout.

Agonist Muscle Group	Antagonist Muscle Group
Pectoralis Major/Chest	Rhomboids/Upper Back
Biceps	Triceps
Deltoids	Lats
Gastrocnemius	Tibialis Anterior
Quadriceps	Hamstrings
Abdominals	Erector Spinae

- **Exercise Large Muscle Groups First:** Within many exercises, the smaller muscles are used to assist in working the larger muscles. Therefore, one should avoid fatiguing the smaller muscles before working the larger muscles in order to work maximally. Perform all triceps and bicep exercises after performing pushing and pulling exercises respectively (see below alternating pushing and pulling actions).
- **Alternate Pushing and Pulling Actions:** Alternate exercises that extend and exercises that flex. Exercises that require joint extension is a pushing action. Exercises that require joint flexion is a pulling action. By alternating pushing and pulling actions, the muscles will have ample time to recover between exercises.

Muscle Group	Large/Small Muscle	Push/Pull Action
Pectoralis Major (Bench Press)	Large	Push (Technically Abduction)
Rhomboids	Large	Pull (Technically Adduction)
Biceps	Small	Pull (Flexion)
Triceps	Small	Push (Extension)
Deltoids (Shoulder Press)	Large	Push (Technically Abduction)
Lats	Large	Pull (Technically Adduction)
Gastrocnemius	Small	Push (Extension)
Tibialis Anterior	Small	Push (Flexion)
Quadriceps	Large	Push (Extension)
Hamstrings	Large	Pull (Flexion)
Gluteus Maximus	Large	Push (Extension)
Abdominals	Large	Pull (Flexion)
Erector Spinae	Large	Push (Extension)

➢ Advance Weight Training Concepts

Varying the Intensity of the Training: Once the body has adapted to the variables of an advanced weigh training program, the personal trainer should increase the intensity of the workout to elicit additional responses and a positive training effect

Periodization

Defined: A method that systematically manipulates volume, intensity, and load in resistance training over a period of time to elicit a specific physiologic response. Periodization allows easy adaptation to the new technique while providing proper physiologic stimuli to key muscle group.

Another term for periodization is cycling. To avoid plateau and/or overtraining, one can schedule cycles of high-intensity with low-intensity workouts over weeks at a time.

7-Week Training Cycle Example: The below chart is an example of periodization. The cycling program varies the training load within the week. At the end of the 3rd and 6th week, the client tests the 1RM to increase the load and sets. The 7th week is a light training week to prepare the body for the next and more challenging 7-Week training cycle. The 1st week and 4th week of the training cycle are the weeks that the load has increased. Within the chart below, the H stands for heavy load (80% of 1RM), MH stands for medium-heavy load (75% of 1RM), and L stands for light load (70% of 1RM).

Testing for New Loads using 1RM: at the end of the 3rd and 6th week, the client will test for a new load. Below are two equations from which to choose.

Brzycki Equation: Weight ÷ (1.0278 - (0.0278 X number of repetitions)) = 1RM
Alternate Equation: Weight X (1 + (0.033 X number of repetitions)) = 1RM

Week	Sets	Monday	Wednesday	Friday
1	3	H	L	MH
2	3	H	L	MH
3	3	MH	L	Test
4	4	H	L	MH
5	4	H	L	MH
6	4	MH	L	Test
7	2	L	L	L
8-14	Repeat 7-Week Training Cycle with heavier loads.			

Overtraining Syndrome

Sometimes a client will become over ambitious in his/her training and become overtrained which can lead to a plateau and eventually burn-out.

Defined: A condition in which there is a plateau or drop in performance over a period of time. The body does not have adequate time to recuperate between training days.

- Causes:
    1. Not enough rest in between workouts
    2. Working out aggressively and beyond ability
    3. Working out too frequently during the week

- Warning Signs:
    1. Irritability
    2. Lack of appetite
    3. Extreme muscle soreness the day after a training session
    4. Decrease in body weight
    5. Inability to complete a training session that should otherwise be completed even though it may be challenging

- Prevention Strategies:
    1. Increase training intensity gradually and systematically
    2. Plan days of rest within the overall workout program
    3. Alternate heavy activity/lifting days with light activity/lifting days; heavy activity/lifting weeks with light activity/lifting weeks
    4. Get adequate sleep
    5. Eat properly
    6. Change up the routine to avoid stagnation

Plateau:

The point at which the body adapts to the overload of the workout and no longer elicits a response

- Quick Tips to Overcome Plateau:
    1. Eat small meals more often during the day
    2. Take an active rest
    3. Change up the workout routine; do different types of activity
    4. Vary the intensity levels throughout the week
    5. Get plenty of sleep during the night to have full energy when working out

Activities of Kinesiology

The below activities can be developed through Advance Weight Training and Specialized Conditioning.

- Category #1: Continued application of a force
    1. Pushing - Extension action that can be trained through advance weight lifting
    2. Pulling - Flexion action that can be trained through advance weight lifting
    3. Lifting - An action that can be trained through advance weight lifting

- Category #2: The development of kinetic energy followed by the release of an object at the moment of maximum desired velocity
    1. Throwing Motions - An example of Category #2 would be throwing a medicine ball as discussed in the specialized conditioning section.

- Category #3: The momentary contact made with an object by a moving part or segment of the body or an implement attached to the body.
    1. Kicking action
    2. Striking action

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

Section #5 Review Questions

1. List and briefly explain the three weight training goals:

2. Explain how to perform a super set:

3. Explain how to perform a pyramid set:

4. Briefly explain the design of a 4-days a week split program:

5. Explain the causes, signs and prevention strategies of overtraining syndrome:

6. List the activities of kinesiology that can be developed through weight training and specialized conditioning.

Specialized Conditioning Programming

The FiTOUR® Advanced Personal Training Certification focuses on advanced assessments, including agility, speed, power, balance, and coordination. The following exercises focus on developing these fitness performance components.

Agility and Speed Development

The following exercises develop agility and speed.
Quality is the key to speed and agility drills being successful. Keep the individual sprints short and rest completely between sets.

General Guidelines for Agility and Speed Drills

1. Warm up thoroughly.
2. Speed and agility drills should be performed on separate days from other training days.
3. One must have a strong fitness base before trying these agility and speed drills.
4. A typical session should consist of approximately 5 sets of 10 repetitions (each sprint being 1 repetition).
5. One-two sessions a week
6. Always mirror the movement patterns of the specific sport or fitness activity when choosing drills that develop agility and speed.

Agility and Speed Exercises

1. Conventional Suicide Drill
    - **Equipment Needed**: 5 Cones
    - **Procedures:** Set up the cones 10 meters 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 4 more times.

2. Uphill Sprint
    - **Equipment Needed:** 2 Cones
    - **Procedures:** Place the 2 cones 10-15 meters apart on a hill with a 30 degree incline. On command from the personal trainer, the client sprints as fast as he/she can from one cone to the other uphill. The client walks back to the first cone to repeat immediately (this is 1 rep). The client should do 5 sets taking a longer break in between sets.

3. Hollow Sprints
    - **Equipment Needed:** 6 Cones
    - **Procedures:** Place the Cones 30 meters 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.

4. Ladder Drills: The personal trainer can set up various agility drills with a ladder.

5. The Weave:
    - **Equipment Needed:** 6 Cones
    - **Procedures:** Set up the cones 10 meters apart. Sprint to the last cone while weaving in and out of the cones, turn around, and weave back to the start. Repeat this drill for a total of 5 sets.

➢ Power Development

Plyometrics

Exercises that are the rapid deceleration and acceleration of muscles that create a stretch-shortening cycle. The exercises train the muscles, connective tissue and nervous system to effectively carry out the stretch-shortening cycle, thereby improving a client's performance. Plyometric drills help develop rhythm, speed, power and even muscular endurance.

Plyometric Safety Guidelines:

1. Warm up thoroughly
2. Plyometric drills should be performed on separate days from other training days
3. One must have a strong fitness base before trying these plyometric drills
4. A typical session should consist of approximately 5 sets of 10 repetitions
5. One-two sessions a week
6. Always mirror the movement patterns of the specific sport or fitness activity when choosing drills that develop power

Lower Body Plyometrics

1. Butt slaps
2. Box jumps
3. Squat jump throw with medicine ball
4. Jump running
5. Single leg hops
6. Tuck jumps

Upper Body Plyometrics

1. Chest throw with medicine ball
2. Overhead throw with medicine ball
3. Pullover throw with medicine ball

Lower Body Plyometrics: Butt Slaps

Equipment Needed: None

Procedure: Run forward by raising the back foot as high as possible kicking the buttocks without raising the knee. The progress forward should be equal to the speed of walking. Perform this drill for 1 minute with 30 second rest between sets.

Sets: 5

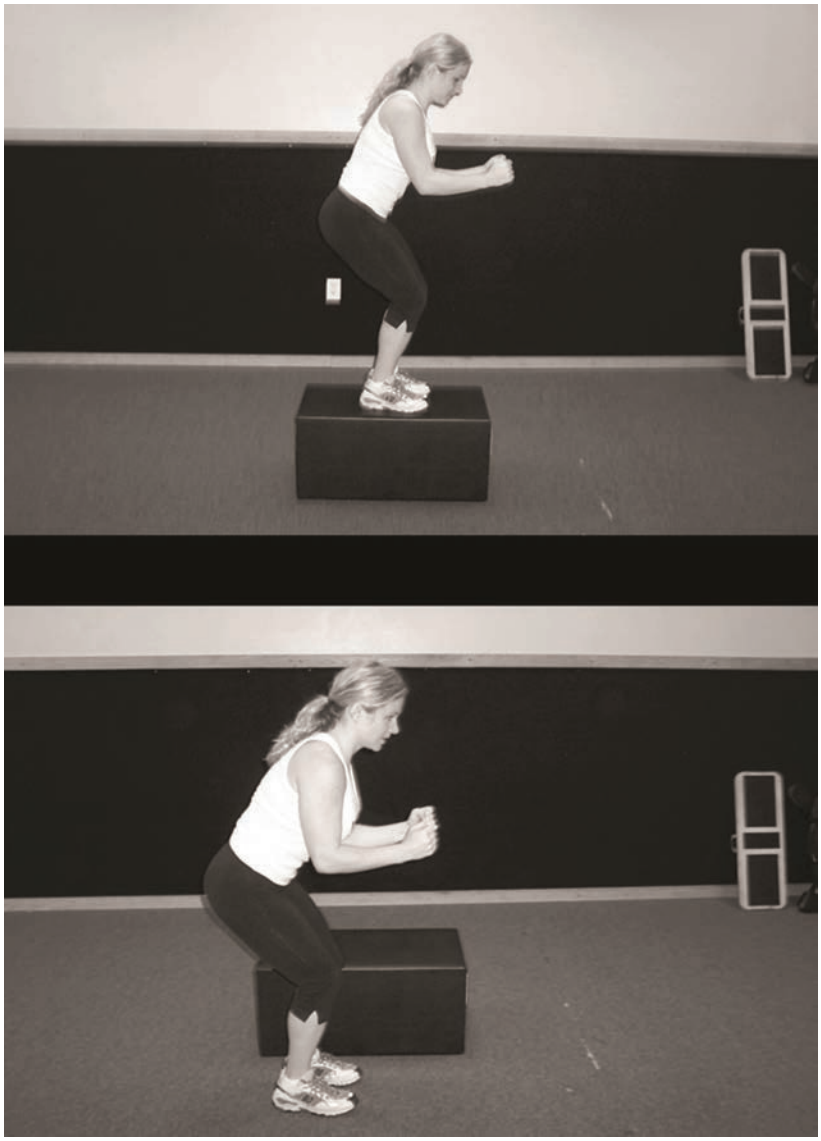
Lower Body Plyometrics: Box Jumps

Equipment Needed: 18-24 Inch Box*

**Tip: Take client ability, skill, age, orthopedic issues into consideration when performing. A lower box or step may be used if appropriate.*

Procedure: Stand on top of the box with feet about hip width apart. Jump down to the side of the box with knees bent and immediately drive knees up to the chest and jump back up to the box. Perform this drill for 30-60 seconds with 30 second rest between sets.

Sets: 5



Lower Body Plyometrics: Squat Jump Throw

Equipment Needed: 3 Pound Medicine Ball

Procedure: Stand with feet hip width apart with knees bent. Squat down to where the thighs are parallel to the floor. Jump vertically and drive arms holding the medicine ball straight up to the sky. Do not release the ball. As you land, immediately squat down and repeat. Minimize the time spent on the ground. Focus on strong explosive and powerful movement. Do as many jumps as you can and rest for 1 minute before the next set.

Sets: 5

Lower Body Plyometrics: Jump Running

Equipment Needed: None

Procedures: Run 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.

Sets: 5

Lower Body Plyometrics: Single Leg Hops

Equipment Needed: None

Procedures: Stand on one leg with the knee bent slightly. Remain standing on the same foot. Jump up as high as possible. Try to minimize the time spent on the ground. Perform the single hops on one side for 30 seconds and then switch to the other leg.

Sets: 5

Lower Body Plyometrics: Tuck Jumps

Equipment Needed: None

Procedures: Stand with legs shoulder width apart with knees slightly bent. Jump up and bring the knees towards the chest. As you land, immediately jump up again, minimizing the amount of time on the ground. Perform the jumps for 30 seconds and rest for a minute before the next set.

Sets: 5

Upper Body Plyometrics: Chest Throw (Medicine Ball)

Equipment Needed: Medicine Ball

Procedures: The personal trainer and the client stand about 10 feet apart. The feet are about shoulder width apart with the knees slightly bent. Using both hands with the ball held at chest height, the personal trainer and client throw the ball back and forth with an explosive pushing action. Perform this exercise for 1 minute and rest for 30-60 seconds before the next set.

Sets: 5

Upper Body Plyometrics: Overhead Throw (Medicine Ball)

Equipment Needed: Medicine Ball

Procedures: The personal trainer and the client stand about 10 feet apart. The feet are about shoulder width apart with the knees slightly bent. Using both hands with the ball held over and behind the head, the personal trainer and client throw the ball back and forth with an explosive pushing action. The arms are always extended when throwing the ball. Avoid arching the back. Perform this exercise for 1 minute and rest for 30-60 seconds before the next set.

Sets: 5

Upper Body Plyometrics: Pullover Throw (Medicine Ball)

Equipment Needed: Medicine Ball

Procedures: The personal trainer and the client position themselves about 10 feet apart. The client lies on the floor with the knees bent and the feet on the floor. The arms are fully extended holding the medicine ball overhead (maybe even touching the floor if possible). With straight arms, the client throws the ball to the personal trainer and the trainer throws the ball back. Perform this exercise for 1 minute and rest for 30-60 seconds before the next set.

Sets: 5

Note: The client can use an exercise ball to improve balance at the same time.

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

Section #6 Review Questions

1. List and be familiar with the safety guidelines when performing plyometric drills:

2. Briefly explain how to perform the Butt Slap exercise:

3. Briefly explain how to perform Box Jumps:

4. How many sets are recommended for the Squat Jump Throw:

5. Briefly explain how to perform Jump Running:

6. Briefly explain how to perform Single Leg Hops:

7. What equipment is needed to perform the Chest Throw?

➢ Balance and Coordination Development

1. Warm up thoroughly
2. Balance and Coordination drills can be performed on any day in combination with the regular training days
3. A typical session should consist of approximately 3 sets of 12-15 repetitions
4. Two-three sessions a week are adequate
5. Always mirror the movement patterns of the specific sport or fitness activity when choosing drills that develop balance and coordination.

Balance and Coordination Exercises

1. Upper body exercises performed standing on balancing disk
2. Squats performed on balancing dome
3. Lunges performed on balancing dome
4. Abductor lifts performed on balancing dome
5. Bridge with exercise ball

Upper Body (Balancing Disks)

Equipment Needed: 2 Balancing Disks

Procedures: Stand on the balancing disks with the right foot on one disk and the left foot on the other. With the weights in each hand, perform bicep curls.

Sets: 3 sets of 12-15 reps

Note: You can perform any upper body resistance exercise while balancing on the disks.

Squats (Balancing Dome)

Equipment needed: 1 Balancing Dome (Resistance tubing is optional)

Procedures: Stand on the balancing dome with the feet hip width apart and knees slightly bent. Squat down as far as possible bringing the thighs no further than parallel to the floor. Pushing upwards, extend the legs straight back to the beginning position.

Sets: 3 sets of 12-15 reps

Note: Resistance tubing, medicine ball or hand weights are optional. When using resistance tubing, place the tubing underneath the dome.

Lunges (Balancing Dome)

Equipment needed: 1 Balancing Dome (Resistance tubing is optional)

Procedures: Place one foot on the dome with the other leg extended backwards on the floor. Place the back ball of the foot on the floor with the heel raised. Bend both knees to 90° as you lunge straight down. Push back up to starting position. Perform 12-15 reps then switch to the other side.

Sets: 3 sets of 12-15 reps on each leg.

Note: Resistance tubing is optional. Place the tubing underneath the dome.

Abductor Lifts (Balancing Dome)

Equipment needed: 1 Balancing Dome (Hand weights are optional)

Procedures: Place one foot on the dome and the other foot on the floor about hip width apart and knees bent in a squat position. Lift the foot that is on the floor abducting the leg to hip level or as high as possible. Lower the leg down and execute again. Perform 12-15 reps then switch to the other side.

Sets: 3 sets of 12-15 reps on each leg.

Note: Hand weights are optional. Place the weights either on the shoulders or on the hips.

Bridge (Exercise Ball)

Equipment Needed: 1 Exercise Ball

Procedures: The client lies on the floor with the feet placed on the ball about hip width apart. The back is completely flat on the floor. Starting at the tailbone the client articulates the spine one vertebra at a time lifting the hips towards the sky. The client pushes the feet into the ball continuing to lift the hips upward. Then the client lowers the back and hips down imprinting the spine into the floor one vertebra at a time.

Sets: 3 sets of 12-15 reps

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

Section #7 Review Questions

1. Briefly explain how to perform upper body exercises using balancing disks:

2. Briefly explain how to perform squats using a balancing dome:

3. Briefly list and explain the guidelines for perform balance and coordination exercises:

4. List the recommended equipment for the following body segments and name an exercise that will develop balance and coordination for each particular body segment:

   a. Upper Body:

   b. Abductors:

   c. Thighs and Glutes:

   d. Back Extensors and Hamstrings:

Core Conditioning

Core Strengthening Exercises

1. Pass the ball with exercise ball
2. Conventional crunches on exercise ball
3. Back extensions on exercise ball
4. Reverse crunches with exercise ball
5. Oblique crunches on exercise ball
6. Plank on forearms, fully extended arms and on exercise ball
7. Push-ups on exercise ball
8. Pilates Single Leg Stretch with exercise ball
9. Pilates Teaser

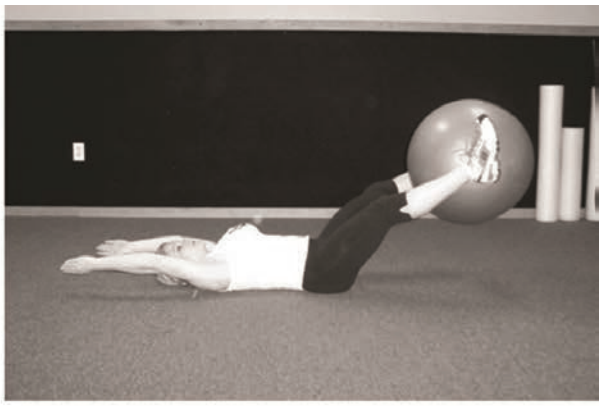
Pass the Ball (Exercise Ball)

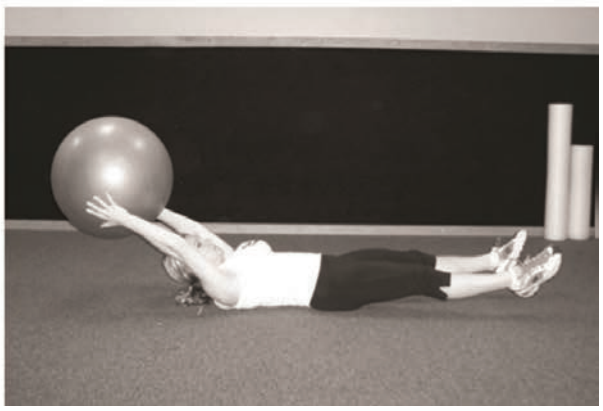
Equipment Needed: 1 Exercise Ball

Procedures: In a supine position, the client passes the exercise ball from the hands to the feet. Then, the client extends the legs out and down and the arms overhead. Then, the client lifts the legs and arms and passes the ball to the hands. The legs lower and the arms extend back overhead holding the ball. Rest for 30-60 seconds between sets.

Sets: 3 sets of 12-15 reps.

Note: The straighter the legs and arms, the more challenging this exercise becomes.





Conventional Crunches (Exercise Ball)

Equipment Needed: 1 Exercise Ball

Procedures: Position the client supine on the exercise ball with the small of the back in contact with the ball and the feet flat on the floor about hip width apart. The client lifts the torso flexing the spine and contracting the abdominals. Rest for 30-60 seconds between sets.

Sets: 3 sets of 12-15 reps

Note: To make this exercise more challenging add a weight plate or throw a medicine ball between the trainer and client.

Back Extension (Exercise Ball)

Equipment Needed: 1 Exercise Ball

Procedures: Position the client prone on the exercise ball with the hips in contact with the ball and the toes in contact with the floor about hip width apart. Place the hands lightly behind the head. The client lifts the torso extending the spine, contracting the abdominals, and squeezing the glutes. Rest for 30-60 seconds between sets.

Sets: 3 sets of 12-15 reps.

Note: To make this exercise more challenging, extend the arms overhead.

Reverse Crunches (Exercise Ball)

Equipment Needed: 1 Exercise Ball

Procedures: Position the client 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°. Lift the hips off the floor bringing the knees towards the chest. Use the abdominals to lift the hips. Rest for 30-60 seconds between sets.

Sets: 3 sets of 12-15 reps.

Oblique Crunches (Exercise Ball)

Equipment Needed: 1 Exercise Ball

Procedures: Position the client in a side-lying position on the exercise ball. The legs are extended to the side with one foot in front of the ball for stability. One hand is behind the head while the other hand is comfortably placed in front of the chest. Laterally flex the spine to one side and lower back down to starting position. Rest for 30-60 seconds between sets. After 3 sets on one side, switch to the other side.

Sets: 3 sets of 12-15 reps.

Note: To modify, place one knee on the floor.

Plank (With or Without the Exercise Ball)

Equipment Needed: 1 Exercise Ball (optional)

Procedures: Position the client in a plank position with the arms fully extended on the exercise ball. The feet are on the floor with the balls of the feet in contact with the floor and the heels elevated. Hold this position for 30 seconds. Rest for 30-60 seconds between sets.

Sets: 3 sets of 5-10 reps

- Modification #1: Perform the plank without the ball
- Modification #2: Perform the plank on the forearms

Push-ups (Exercise Ball)

Equipment needed: 1 Exercise Ball (optional)

Procedures: Position the client in a plank position with the arms fully extended on the exercise ball. The feet are on the floor with the balls of the feet in contact with the floor and the heels elevated. Lower the chest down towards the ball by flexing the elbows. Push back up to starting position. Rest for 30-60 seconds between sets.

Sets: 3 sets of 5-10 reps

Pilates Single Leg Stretch (Exercise Ball)

Equipment needed: 1 Exercise Ball (optional)

Procedures: Position the client in a supine position with one knee towards the chest and the other leg fully extended off the floor. The arms are fully extended above the chest holding the ball. Alternate the knees towards the chest while holding up the ball. Pull the navel to the spine to engage the abs. Rest for 30-60 seconds between sets.

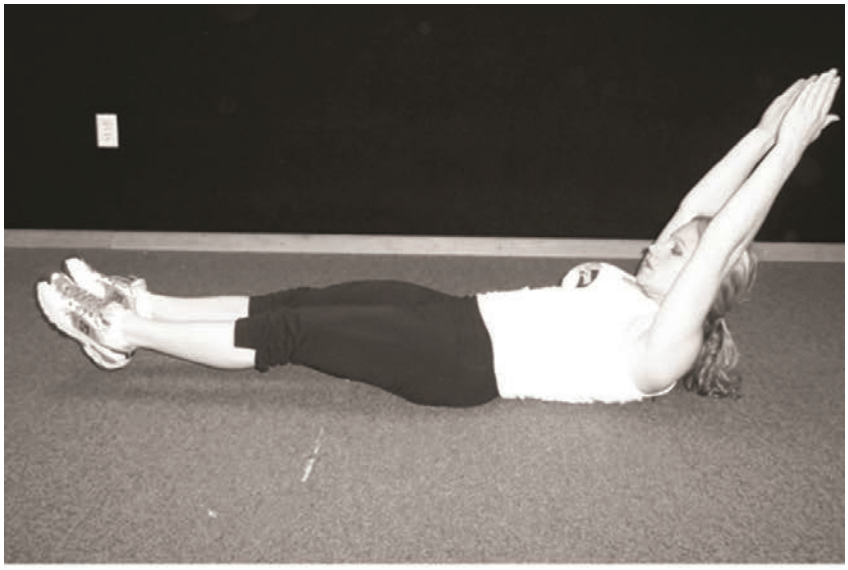
Sets: 3 sets of 5-10 reps

Pilates Teaser

Equipment Needed: None

Procedures: Position the client in a supine position with the legs and arms fully extended off the floor. In one smooth movement, lift the legs and torso to a V-seated position. With the arms extended, hold the "V" position then lower the body back to the starting position. Rest for 30-60 seconds between sets.

Sets: 3 sets of 5 reps



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

Section #8 Review Questions

1. Briefly explain how to modify the pass the ball exercise to be less challenging for individuals who may experience tight hamstrings:

2. Briefly explain how to perform conventional crunches on an exercise ball:

3. Briefly explain how to perform a back extension on an exercise ball:

4. Briefly explain how to perform oblique crunches on an exercise ball and provide a modification for individuals who may experience problems balancing while performing the exercise:

5. Briefly explain how to perform plank using an exercise ball:

6. Briefly explain how to perform push-ups using an exercise ball:

Common Sport and Conditioning Injuries

The inevitable injury, whether it is acute or chronic, is an issue that a personal trainer may experience with a client. Although a personal trainer should never diagnose an injury, he/she can be aware of the common injuries. If a client complains of pain and the pain does not subside in 10 days, the personal trainer should advise his/her client to see the client's doctor. The personal trainer can apply the **RICEM** concept to an acute injury.

Rest the injured body part or entire body

Ice the injured body part

Compress the injured body part to reduce swelling if applicable

Elevate injured body part above heart

Modality of exercise should be altered to give the injured area enough time to heal

Common Causes of Injuries:

- **Intrinsic Causes**
  - Lack of Strength
  - Poor Flexibility
  - Posture Defects
  - Weak Joints
  - Improper Hydration
  - Muscle Imbalance
  - Excess Body Weight
  - Poor Endurance
  - Poor Warm-Up

- **Extrinsic Causes**
  - Uneven Surface
  - Faulty Equipment
  - Improper Footwear
  - Sudden Trauma
  - Bad Weather

Common Chronic Injuries:

Most sport or conditioning injuries are due to overuse or misuse of the muscles and connective tissues. Below are common injuries and tips on how to prevent them.

- **Muscle Pull**
  Prevention: Warm-up before a workout and stretch after the workout. Do not bounce while stretching.
- **Runner's Knee**
  Prevention: Strengthen the muscles, tendons, and ligaments surrounding the knee by performing leg extensions.
- **Shin Splints**
  Prevention: Well-cushioned shoes with arch supports can help prevent excessive jarring of muscles. If possible, athletes should exercise on soft surfaces like wood or grass and avoid working out on hard surfaces like pavement or concrete. Athletes should warm up slowly and stretch after participating in rigorous activity.
- **Stress Fractures**

Prevention: Do complete warm-ups and cool-downs that benefit all areas of the body. Do not exercise or put too much stress on one part of the body.

- **Tennis Elbow**
  Prevention: Build forearm strength by doing reverse curls with light weights or by squeezing a rubber ball.
- **Shoulder Pain**
  Prevention: Roll the shoulders forward and then backwards to release tension.
- **Plantar Fasciitis**
  Plantar fasciitis is the most common cause of pain on the bottom of the heel and usually indicated by pain in the first steps of the morning. Pain also occurs with the onset of activity such as walking and running, which subsides as activity progresses, and usually returns after resting and then resuming activity. Plantar Fasciitis is an inflammatory response and is common in runners performing repetitive plantar flexion and dorsiflexion of the toes. It is also common with sudden weight gain.
  Prevention: Wear supportive shoes. Massage the bottom of the foot by rolling it over a bottle.
- **Tendinitis**
  Inflammation (redness, soreness, and swelling) of a tendon
- **Impingement Syndrome**
  The trapping of an inflamed tendon under a joint
- **Bursitis**
  An inflamed bursa sac that is supposed to protect the joint
  Prevention of Tendinitis, Impingement Syndrome, and Bursitis: Avoid performing the same exercises without rest in between sessions.

Common Acute Injuries:

Acute injuries are ones that occur immediately during an activity and should be treated with RICEM. The client should be referred to his/her doctor immediately.

1. **Strain** - An injury to a tendon (the tissue that connects bone to muscle).
2. **Sprain** - An injury to a ligament (the tissue that connects bone to bone).
3. **ACL Injury** - Injury to the cruciate ligaments of the knee is sometimes referred to as a "sprain." The anterior cruciate ligament is most often stretched, torn, or both by a sudden twisting motion (for example, when the feet are planted one way and the knees are turned another way). The posterior cruciate ligament is most often injured by a direct impact, such as in an automobile accident or football tackle.
4. **Abrasions ("Road Rash")** - Abrasions are very common sport injuries that are usually caused by a fall on a hard surface. As the athlete falls or slides on the ground, friction causes layers of skin to rub off. The skin is composed of an outer layer (the epidermis) which provides protection, and a deep inner layer (the dermis) which provides the firmness and flexibility of the skin. Abrasions typically refer to an injury that removes these layers of skin.
5. **Muscle Cramps** - A cramp is an involuntary and forcibly contracted muscle that does not relax. Cramps can affect any muscle under your voluntary control (skeletal muscle). Muscles that span two joints are most prone to cramping.

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

Section #9 Review Questions

1. Explain the acronym RICEM:

2. List three common causes of injuries which can occur while performing fitness activities:

3. List five common chronic sports or conditioning injuries that can be caused through overuse or misuse of the muscles and connective tissues; include methods of prevention of each injury listed:

4. Briefly explain the difference between a chronic injury and an acute injury:

5. List the five common acute sports injuries and steps that should be taken if an individual suffers such injury:

Appendix / Forms

Permission is given by FiTOUR® to copy the forms on the following pages to use for Personal Fitness Training.

Goal Setting Questionnaire

DEGREE of SATISFACTION with Current Level of Fitness *Check the best number for each aspect of your current fitness level, using this scale:* *4 = Very Satisfied 3 = Satisfied 2 = Dissatisfied 1 = Very Dissatisfied*	**4**	**3**	**2**	**1**
Amount of Energy				
Cardiovascular Endurance				
Muscular Strength and Endurance				
Flexibility of Hamstrings and Low Back				
Ability to Cope with Tension and Stress				
Ability to Relax				
Ability to Get a Good Night's Rest				
Low Back Function				
Physical Appearance/Body Weight				

AREAS of IMPROVEMENT
Take a few moments to think about the areas of your life which you feel need improvement. Briefly list areas of improvement below.

1. Specific Physical Problem:

2. Appearance of Particular Part of Body:

3. Ability to Participate in a Specific Sport (e.g., tennis, skiing, running)

4. Risk of a Health Problem:

5. Other:

PLAN OF CHANGE
Identify Habit Patterns That Create Roadblocks

1. Food Choices

2. Exercise Choices

3. Unhealthy or Negative Thoughts

4. Unhealthy or Negative Behaviors (smoking, alcohol, drug abuse, caffeine, diet sodas, etc.)

5. Daily Activities/Habits: Briefly examine the activities of a typical day. List each activity and the time you generally participate in that activity.

AM:

Mid-AM:

Noon:

Mid-Afternoon:

Early PM:

Late PM:

BEHAVIORAL CHANGE CONTRACT

I _____(client) do agree that I will adhere to the suggested exercise and diet guidelines as set forth by _____ (trainer):

1. I will attend all scheduled Personal Training Sessions at _____am/pm on _____ day(s) for _____ weeks beginning on _____, 20___ and ending on _____, 20___.

2. I will keep a daily journal in which I record daily exercise activities.

3. I will keep a daily journal in which I record food and calorie consumption.

4. I commit to having positive thoughts and engaging in positive behaviors.

5. I commit to letting go of habit patterns that are unhealthy and negative and that have kept me from successfully reaching my goals in the past.

6. I commit to forming new habit patterns that are healthy and positive to replace the old habit patterns in a constant effort to improve the areas of my life that I identified as needing improvement.

7. I commit to advising _____ (trainer) of any injury or illness I experience.

8. I commit to asking for modified exercises if the execution of an exercise being performed during any training sessions results in pain or feels as if it could cause injury.

9. I commit to taking each day one at a time and to making positive changes every day.

10. At the conclusion of the time period listed above, I commit to adopting and maintaining all of the positive changes and new habit patterns formed during the training program.

Signed _____ Date _____

Advance Functional and Fitness Performance Assessment Record

This form can be used to record a client's performance during advanced functional and fitness performance. By maintaining and recording assessment scores, a client's progress can be easily tracked and adjustments can be made to a program to continue to improve performance. This form may be copied or adapted from the "Forms" section in the back of this manual.

TEST	SCORE	RETEST SCORE
Functional Strength Tests		
Total Leg Strength Test		
Hamstring/Quadriceps Strength Test		
Bench Press		
Functional Flexibility Tests		
Sock Test		
Fingertip-to-Floor Test		
Muscle Coordination - Ball Toss Test		
Muscle Balance/Imbalances Tests		
Dynamic Measurement		
Static Measurement: The Stork Test		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		
Postural Inspection		

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