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ACE Integrated Fitness Training™ (ACE IFT™) Model for Exercise Program Design

Learning Checklist

- ✓ Explain why the ACE IFT model was created.
- ✓ List the components of the ACE IFT model.
- ✓ Define rapport and explain how it fits into the ACE IFT model.
- ✓ Discuss using client-specific intensity markers in the ACE IFT Model.
- ✓ Discuss the importance of building foundations in each component of the ACE IFT Model.
- ✓ Discuss the progressions through each phase of the training components in the ACE IFT Model.

Section 1

Background

The ACE IFT model was created to meet the needs of an evolving fitness industry. What once may have been a relatively straightforward profession, has come to include a growing population of clients with special health and fitness needs. As many of you know, personal trainers today see clients of all ages and fitness levels, many of whom are new to exercise.

Did you know that new exercisers are likely to quit exercising within their first three to six months, even *with* the help of a personal trainer? This group of clients is an important demographic to reach, as the obesity epidemic in America continues to grow.

We also found that there is a disconnect between personal trainers and their clients. While many trainers believe that clients don't return to work with them due to cost, the fact is that sixty-eight percent of clients not returning reported that it was due to a negative experience with the trainer, with only fourteen percent stating that it was actually due to cost. So there was a need for personal trainers to learn how to connect with all of their clients in a way that drives retention and increases participation in exercise. It was critical in this new model to incorporate the *art* of building relationships with the *science* of exercise program design.

The ACE IFT model was also created to help new and experienced trainers make sense of the abundance of information available regarding all aspects of health and fitness. There are a lot of programming guidelines to meet the needs of individuals at various stages of health and fitness, but fitness professionals are not always offered a clear direction of how to implement these guidelines into a successful program.

There was an obvious need for a straightforward but comprehensive blueprint, an approach that addressed how to design a complete program for every individual, to counteract the confusion created from the information overload available to fitness professionals.

We set out to develop this comprehensive and systematic approach that not only integrates assessments and programming to facilitate behavior change but also addresses posture, movement, flexibility, balance, core function, cardiorespiratory fitness, muscular endurance and muscular strength.

It was an ambitious goal, but we were determined to help personal trainers pull it all together and help their clients succeed. We were determined to provide fitness professionals with a blueprint to help them navigate the science to develop individualized, unique programs for each client.

Overview

The big picture of the ACE IFT model starts with the health, fitness and performance continuum. This continuum is based on the principle that all clients are currently at some point along the continuum, and that quality fitness professionals can help them to progress along this continuum.

The foundation of the model is **rapport**. Creating rapport promotes open communication and develops trust with your client. This is key for improving your client's participation in their program and starting the process of long-term change.

There are two training components to the ACE IFT model – **Cardiorespiratory Training** and **Functional Movement and Resistance Training**. Each component is comprised of four phases along **the health, fitness, performance continuum**. The phase of each component your client fits into depends primarily on their fitness level at the time you're designing their exercise program.

Rapport

If you want to be successful, you must begin by establishing rapport with each client. This is a critical and largely overlooked first stage. It serves as the groundwork for developing appropriate and successful fitness programs for anyone by assessing and understanding the whole person, from their physical activity levels, health and nutrition habits and health history, to their readiness-to-change behavior and expected outcomes. For new or returning exercisers, an initial positive experience will increase their chances for long-term exercise adherence. The ACE IFT model will help you create these positive experiences by building rapport and determining which early assessments are beneficial and which can be detrimental for each client.

Section 2

Cardiorespiratory Training Component

The ACE IFT model takes a new approach to cardiorespiratory training. Traditionally, program design has focused on steady-state training to improve cardiorespiratory fitness, with workload generally progressed through increased duration and intensity and the use of loosely categorized intervals to reduce boredom, or training intervals to improve speed during endurance events.

The ACE IFT model takes a systematic approach to cardiorespiratory training that can take a client from being sedentary to training for a personal record in an event such as a half-marathon. While this may not be the goal for most clients, having an organized system that can allow for long-term progression like this, is empowering for the personal trainer.

There are four phases in this training component. Phase 1 of the cardiorespiratory training component is **Aerobic-base** training. This phase is designed to improve health and create positive exercise experiences and progresses to improving cardiorespiratory fitness in Phase 2, the **Aerobic-efficiency** training phase. Phase 2 is likely where many clients will train for years to maintain overall fitness levels.

Clients with competitive endurance goals will progress to Phase 3, **Anaerobic-endurance** training. Only those clients with specific needs for near-maximal speed during endurance events or competitive sports activities will train in Phase 4, the **Anaerobic-power** training phase.

Each client will have a unique entry point into these cardiorespiratory training phases based on his or her current fitness level, so not every client will start in Phase 1 and not every client will progress to Phase 3 or 4. By learning to use the assessment and programming tools in each phase, you can develop individualized cardiorespiratory programs that can progress clients from being sedentary to improving fitness to training for performance in endurance events.

Three – Zone Training Model

Cardiorespiratory training in the ACE IFT model uses client –specific intensity markers that include:

- The talk test
- Heart rate at the first and second ventilatory thresholds (VT1 & VT2)
- Ratings of perceived exertion (RPE)

Traditional cardio intensity markers such as percentages of maximal heart rate (%MHR), heart rate reserve (HRR) or VO_2 reserve (% VO_2R) are not recommended for use within the ACE IFT model because of the inherent error of predicted maximum heart rate and predicted VO_2 max. Using these parameters requires actual measurement of maximum heart rate and VO_2 max to provide accurate individualized data for programming. Most personal trainers do not have the equipment to assess VO_2 max and there is little or no reason to find a client's actual maximum heart rate or VO_2 max, as these measurements are generally reserved for endurance athletes and research studies. Also, most clients do not want to push themselves to this true maximum as it is painful. So, personal trainers using these traditional intensity markers must estimate maximum heart rate and VO_2 max using equations with large standard deviations. Exercise guidelines based on these traditional intensity markers can help clients reach their goals, but they have a lot of room for error.

Training parameters in the ACE IFT model are instead set around a three-zone training model based on each client's unique metabolic response to exercise. To use the three-zone training model within the ACE IFT model, you must first have working knowledge of the ventilatory response to exercise.

VT1 and VT2

During exercise, higher levels of intensity cause an increase in respiration to allow larger volumes of air to move into and out of the lungs to facilitate increased delivery of oxygen and the removal of carbon dioxide.

The volume of air moving into and out of the lungs in one minute is called minute ventilation (V_e). This increases linearly, with the exception of two distinct deflection points at VT1 and VT2. When exercising below VT1, fats are the primary fuel source and the small amounts of

lactic acid produced are utilized. As intensity goes up toward VT1, the body responds by increasing the amount of air inspired with each breath (otherwise known as tidal volume).

At the point of VT1, the major fuel source switches from fats to carbohydrates and lactate begins to accumulate in the blood. The bicarbonate buffering system works to neutralize the increased lactate. This leads to increased cellular production of carbon dioxide, which must be exhaled. The body then increases ventilation by increasing breathing frequency. This creates the first deflection point in minute ventilation at the first ventilatory threshold, or VT1.

As exercise intensity continues to increase, it will eventually reach a point where the buffering mechanism can no longer keep up with the extra lactate production, and the pH of the blood begins to drop. This results in another increase in respiratory rate, causing the second non-linear increase in minute ventilation known as the second ventilatory threshold, or VT2. This point is generally associated with the **onset of blood lactate accumulation, or OBLA**. If exercise continues at or above VT2, blood lactate levels will rise quickly. This intensity at VT2 is what most fitness professionals and athletes refer to as the anaerobic or lactate threshold. Exercise intensities just below VT2 represent the highest intensity an individual can sustain for approximately 20 to 30 minutes. When an individual increases the workload performed at VT2 he or she will improve performance in endurance events.

The first and second ventilatory thresholds can be accurately assessed using metabolic analyzers; however, these systems are not readily available to most personal trainers. Fortunately, field tests can be used to determine reliable heart rate values at VT1 and VT2. The field test for VT1 is based on research that has found the talk test to be a very good marker of VT1. Below VT1, clients can speak comfortably. Once they reach VT1, they will still be able to speak, but it will be slightly uncomfortable. The **submaximal talk test for VT1** can be conducted with clients to determine their heart rate at VT1. This value is important for programming in cardiorespiratory Phases 2 through 4. You can find a detailed explanation of the submaximal talk test for VT1 in the 4th edition of the ACE Personal Trainer Manual.

The talk test can also be used as a fairly accurate marker of VT1 in clients who have not yet performed the submaximal talk test for VT1. This is especially important for clients in Phase 1, where exercise should be kept below the talk-test threshold.

The field test for VT2 is based on the premise that exercise intensities just below VT 2 are the highest sustainable intensities and are excellent markers of performance. Clients can sustain exercise at or just below VT2 long enough to collect repeated heart rates to get an average heart rate calculation at VT2. The VT2 threshold test can be conducted with clients to determine exercise heart rate at VT2. This value is important only for clients training in Phases 3 and 4.

Ratings of perceived exertion, or RPE, also correlate fairly well with this three-zone training model:

- Zone 1 equates to an RPE description of “moderate to somewhat hard” or a 3 to 4 on a scale of 1 to 10.
- Zone 2 equates to an RPE description of “hard” or 5 to 6 on the 1 to 10 scale.
- Zone 3 equates to a description of “very hard” to “extremely hard” and a 7 to 10 on the scale.

As such, RPE can also be used by clients to track training intensities.

Phase 1: Aerobic-base training

Clients that cannot perform 30 minutes of continuous moderate intensity exercise should begin cardiorespiratory training in Phase 1. This is a common starting point for many clients, especially those that are sedentary or have special needs. The most important goal in this phase is to help clients to have early positive exercise experiences to drive program adherence. Regular exercise participation will help clients see initial physiological adaptations to exercise, achieve early goals, enhance self-efficacy, lower stress levels and see improvements in mood and energy. Clients with limited functional capacities may continue to train in Phase 1 for years.

The focus of Phase 1 is to help clients that are sedentary or have little cardiorespiratory fitness to engage in regular exercise. This is to initially improve health and then to build fitness. Exercise in Phase 1 should be performed in Zone 1. If a client is not able to speak comfortably during exercise, he or she has gone over the talk test threshold and exercise intensity should be decreased. Exercising in Zone 1 has a high benefit to risk ratio for beginning exercisers. To help enhance exercise enjoyment, use different exercise modes and vary exercise intensities within Zone 1, up to an RPE of 4.

Cardiorespiratory fitness assessments are not necessary in Phase 1, as all exercise is performed in Zone 1, below the talk test threshold. Additionally, poor performance on fitness tests can deflate the enthusiasm that a sedentary client has for starting an exercise program and create a negative exercise experience.

Progressions in Phase 1 should focus on increasing exercise duration and frequency to facilitate health improvements and caloric expenditure. Increases shouldn't exceed ten percent from one week to the next and once clients are performing 30 minutes of continuous exercise just below the talk test threshold, they are ready to move to Phase 2.

Phase 2: Aerobic-efficiency training

Clients that can perform 30 minutes or more of continuous moderate-intensity exercise and are not currently training for performance in endurance events should train in Phase 2. This is the phase where most fitness enthusiasts will train for extended periods, as many fitness and weight-loss goals can be achieved in this phase, including completing a one-time event such as a half marathon.

The principal training focus in this phase is on improving aerobic efficiency. This is first accomplished through increasing exercise session time and frequency. The main limitation will be the client's available time to exercise. Training should then progress with the introduction and progression of Zone 2 intervals.

A submaximal talk test should be conducted at the beginning of Phase 2 to determine the client's heart rate at VT1. This heart rate will be used as the marker to differentiate between exercise in Zones 1 and 2. This assessment should be performed periodically to determine if heart rate at VT1 increases with fitness improvements. The VT2 threshold test is not necessary in this phase.

In Phase 2, the warm-up, cool-down, recovery intervals and steady-state exercise should be performed in Zone 1 to continue building the client's aerobic base and to allow for adequate recovery following Zone 2 intervals. Low Zone 2 intervals, at an RPE of 5, should be introduced at a heart rate that is just above VT1. These intervals will help increase the workload performed at VT1, resulting in greater caloric expenditure and fat utilization just below VT1.

As the client's fitness increases, steady-state exercise bouts with efforts just above VT1 can be introduced. Intervals can be progressed to the upper end of Zone 2, at an RPE of 6.

Phase 3: Anaerobic-endurance training

Clients that are highly trained fitness enthusiasts performing seven hours or more of cardiorespiratory exercise per week should progress to Phase 3. This phase is appropriate for clients that have endurance-performance goals requiring adequate training volume, intensity and recovery to peak for performance. It's not necessary for clients to be elite athletes to train in Zone 3, but they do need to be motivated by goals that go beyond just finishing an event.

At the beginning of Phase 3, the submaximal talk test and the VT2 threshold test should be given to determine the client's heart rate at VT1 and VT2. These heart rates will be used as markers to differentiate between training Zones 1, 2 and 3.

These assessments should be performed periodically, to determine if heart rate at VT1 or VT2 change with improved fitness. For multi-sport athletes, conduct these assessments for all primary exercise modalities where the assessment can be performed, excluding the pool, as heart rate at VT1 and VT2 can vary among training modes.

Exercise programming in Phase 3 is focused on helping clients improve anaerobic endurance so they can perform more physical work at or near VT2 for an extended period, which results in improved speed, power and performance. Training time should be distributed as follows:

- 70 to 80 percent of training time in Zone 1
- less than 10 percent in Zone 2
- 10 to 20 percent in Zone 3

This is the training distribution used by elite athletes in a variety of endurance sports including Nordic skiers, cyclists and runners. The large percentage of training time in Zone 1 allows endurance athletes to perform large training volumes without overtraining. Training in Zone 1 includes warm-ups, cool-downs, long-distance workouts, recovery workouts, and recovery intervals following Zone 2 and Zone 3 intervals.

The volume of training time is higher in Zone 3 than Zone 2 because work in Zone 3 has been found to produce the greatest improvements in aerobic capacity. The least amount of

work is performed in Zone 2 since intensity has been found to be hard enough to make a person fatigued, but not hard enough to really provoke the optimal adaptations seen with Zone 3 training.

The frequency and focus of Zones 2 and 3 are based on the client's event goals, strengths and weaknesses, and capacity for recovery. Highly fit clients may perform two to four interval workouts per week, while clients new to this type of training may perform only one Zone 3 interval workout per week. Zone 2 intervals will generally be of longer duration, but lower intensity than Zone 3 intervals, while Zone 3 intervals will have longer recovery intervals following work intervals to allow for recovery from these high-intensity intervals. The total volume of training (duration, intervals, etc.) should be progressed no more than 10 percent per week. Only clients with endurance-performance goals that involve repeated sprinting or near-sprinting efforts during endurance events should progress to Phase 4 training.

Phase 4: Anaerobic-power training

Athletes that might perform Phase 4 training include soccer athletes, cross country runners and cross country skiers. The underlying physiologic principle of this type of training is that if there is substantial and sustained depletion of the phosphagen stores and accumulation of lactate, the body will adapt with a larger phosphagen pool and potentially larger buffer reserves to increase the workload performed at VT2.

The principal focus of Phase 4 training is on helping clients with very specific goals related to high-speed performance during endurance events to develop anaerobic power. As in Phase 3, assessments for Phase 4 include the submaximal talk test and the VT2 threshold test to determine heart rate at VT1 and VT2.

These heart rates are then used to establish training Zones with total training time similar to Phase 3:

- 70 to 80 percent of training time in Zone 1
- less than 10 percent in Zone 2
- 10 to 20 percent in Zone 3

The difference between Phase 4 and Phase 3 training is that the Zone 3 intervals in Phase 4 are performed at or near maximal intensity. As such, they are of very short duration and have much longer recovery periods. Most clients will never train in Phases 3 or 4. This is due in part

to the focus of these phases on training for performance in endurance events, and because Zone 3 intervals are very uncomfortable, especially in Phase 4 training. The training intensity in Phase 4 is so great that even elite athletes will spend only a fraction of their annual training plan focused in this phase.

Training should be periodized with a regular cycle of hard and easy days within a week, and a regular cycle of hard and easy weeks within a month. This will allow for adaptation to the demands imposed during harder training sessions and weeks. The more challenging the training program, the more important recovery becomes. It is essential to help clients understand that to achieve their goals on hard training days; they must recover on their recovery days. Always remember that your clients are not only recovering from their training program, but also from the other stressors that impact their lives, such as work, travel, family and a lack of sleep.

Section 3

Functional Movement and Resistance Training Component

Functional movement and resistance training are often treated as two separate and unrelated types of training. The ACE IFT Model treats them appropriately as one continuum that starts with postural stability and joint mobility, and advances at the high end to training for athletic performance.

The Functional Movement and Resistance Training component of the ACE IFT Model provides a blueprint of assessments and programming progressions that personal trainers can use to first address a client's needs for improved postural and joint stability and mobility, and then help clients to develop good movement patterns before moving on to loading movements with external weight, and finally incorporating training for improved athletic performance for those clients who have athletic goals.

The Functional Movement and Resistance Training component addresses the notion of **dysfunctional fitness** that results from loading poor, or compensated movement patterns with advanced exercises and external loads. Most deconditioned adults exhibit limited mobility and stability throughout the kinetic chain, causing them to resort to compensated movement patterns in many daily activities and especially when performing complex exercises or using advanced equipment. This raises the concern whether traditional resistance training, without regard to the individual's limitations in postural stability, joint mobility or movement patterns, is actually doing more harm than good. Many clients have goals that include "sculpting", "toning" or "improving muscle definition", which are goals for a client in Phase 3 of Functional Movement and Resisting Training. However, progressing to this phase of the training before addressing muscular imbalances may actually worsen any existing dysfunctions and could lead to long-term injuries for your client.

The first two phases of the Functional Movement and Resistance Training component serve as a critical foundation to all training and are the basis from which load and performance training should begin. It should be noted, and you may know this from your own experience, that educating clients and athletes on the importance of this foundation can prove challenging. While a client's goals may be consistent with load training, they may require initial training in Phases 1 and 2 to ensure that existing compensations and dysfunction are not exacerbated.

Stability and Mobility

What exactly do we mean when we say “stability” and “mobility”? Let’s briefly define the terms used in this component of the ACE IFT model.

- **Joint stability** is the ability to maintain or control joint movement or position. This is achieved by the synergistic actions of the components of the joint (e.g., muscles, ligaments, joint capsule) and the neuromuscular system. Stability should be achieved without compromising joint mobility.
- **Joint mobility** is the range of uninhibited movement around a joint or body segment. This is also achieved by the synergistic actions of the joint components and neuromuscular system. Mobility should be achieved without compromising joint stability.

What happens to joint movement along the kinetic chain when appropriate levels of mobility are lacking? Adjacent, more stable joints may need to compromise some degree of stability to facilitate the level of mobility needed at the moving joint.

Phase 1: Stability and Mobility Training

The goal of Phase 1 in the Functional Movement and Resistance Training component of the ACE IFT model is to develop postural stability throughout the kinetic chain without compromising mobility and to reestablish joint mobility without compromising stability. The focus should be on the introduction of low intensity exercise programs to improve muscle balance, muscular endurance, core function, flexibility and static and dynamic balance to improve the client’s posture.

No assessments of muscular strength or endurance are required prior to designing and implementing an exercise program during this phase.

Assessments that are conducted are:

- Posture
- Balance
- Movement and
- Range of Motion assessments

Based on the results of these assessments, an exercise program should be implemented to address any weaknesses and imbalances. Assessments for muscular endurance of the torso muscles can be done after the implementation of this program.

All assessment protocols for in this training component are covered in detail in the 4th edition of the ACE Personal Trainer Manual.

Phase 2: Movement Training

The focus of Phase 2 is on training movement patterns. Building on Phase 1 training, the goal is to help clients develop good movement patterns and improved mobility within the kinetic chain without compromising stability.

The training focus is on the five primary movements:

- Bend and lift (squatting)
- Single leg movements (walking and lunging)
- Pushing
- Pulling
- Rotation

Assessments recommended in this phase are detailed in Chapter 7 of the 4th edition of the ACE Personal Trainer Manual.

Programs should emphasize proper sequencing of movements and control of the body's center of gravity throughout normal range of motion during body segment and full body movements to develop efficient neural patterns.

Once a client can perform movement patterns effectively while maintaining stable posture, center of gravity and movement speed, he or she can progress to Phase 3. Detailed tools and strategies for training movement patterns can be found in Chapter 9 of the ACE Personal Trainer Manual.

Phase 3: Load Training

Training in Phases 1 and 2 addresses postural imbalance and muscle motor control to develop postural stability and proper movement sequences. This allows for external loads to be added during full body movements, with a minimized risk for injury.

In Phase 3, the focus is to advance what was developed in the earlier phases with the addition of external loads.

There are two primary ways to assess a client's existing levels of muscular fitness:

- Test muscular endurance by seeing how many repetitions a client can perform of a particular exercise before reaching a level of fatigue that prevents further repetitions.
- Test the client's strength in a specific lift to determine the maximum weight he or she can lift for a defined number of repetitions. A one repetition maximum (1RM) is the most precise test of maximal strength, but a 10 repetition maximum can be used with clients who do not possess the fitness or lifting skill to safely perform a 1RM.

Information from these assessments can be used to determine the loads for the next exercise session. Reassessments are important in that they enable a client to see the results of their exercise efforts, which works to increase program adherence. Detailed information on protocols for assessing muscular strength and endurance are detailed in Chapter 8 of the ACE Personal Trainer Manual and exercise programming strategies for load training can be found in Chapter 10 of the manual.

It is important to note that some clients will not be comfortable with fitness assessments of muscular strength and endurance. Personal trainers can still design programs in Phase 3 of the ACE IFT Functional Movement and Resistance Training component by applying the appropriate training principles while working with the client to determine weight load that will fatigue the muscles in the desired repetition range for the desired outcome. By noting the weight lifted during each session, the trainer can show the client when he or she has made strength gains without using formal assessment protocols. For clients uncomfortable with fitness assessments, this approach should facilitate program adherence.

It is during training in Phase 3 that personal trainers will apply the body of knowledge of exercise science related to resistance training to design and progress exercise programs to meet the diverse goals of their clients.

A client's specific training goals will dictate the unique focus of his or her program with Phase 3. Since this phase is focused on resistance training, many clients will stay in this phase for many years, especially if they have no performance goals. It is the personal trainer's role

to help client's stay motivated by designing and modifying programs to introduce variety and work toward goal attainment. It is also the personal trainer's role to reassess a client's stability, mobility and movement patterns if their client has lapsed in their training in Phase 3 before reintroducing load training. This helps the trainer to determine if the client has developed or reestablished postural deviations, muscle imbalances or movement errors. Exercises from Phases 1 and 2 workouts should make up the dynamic warm-up during Phase 3 workouts. This promotes continued reinforcement of good movement patterns, mobility, and stability, and provides movement preparation prior to loading the movements during each exercise session.

Before progressing to Phase 4, clients should develop the prerequisite strength necessary to move into training for power, speed, agility and quickness.

Phase 4: Performance Training

The focus of Phase 4 is specific training to improve speed, agility, quickness, reactivity and power. Many clients will not progress to this phase of training. Those in Phase 4 should continue to maintain postural stability and proper movement patterns, which can be facilitated by incorporating Phase 1 and Phase 2 training as dynamic warm ups.

If a client meets all of the prerequisites for performance training and expresses an interest in increasing the intensity of his or her training program with power-based exercises, the next step is assessing the client's current level of muscular power and goals to determine the appropriate exercises and progression of the program. The outcome of assessments like the vertical jump, horizontal jump or seated medicine ball chest-pass will provide valuable information about the client's current muscular power output. This can then be used to demonstrate progress as the client follows the Phase 4 program.

Specific assessments for Phase 4 can be found in Chapter 8 of the 4th edition ACE Personal Trainer manual.

Exercise selection in this phase can include a variety of techniques, including:

- Plyometrics
- Medicine ball throws
- Kettlebell lifts
- Traditional Olympic style lifts

FITT components used in this phase are applied consistent with program design for power training and emphasize intensity and technique over reps. Performance training in Phase 4 of the ACE IFT Functional Movement and Resistance Training component also includes assessments and programming drills to improve speed, agility, quickness and reactivity for improved performance during field, court, and other sports requiring high levels of athleticism.

Detailed descriptions for designing and progressing exercise for Phase 4 are found in Chapter 10 of the 4th edition of the ACE Personal Trainer Manual.

Power-based training is also effective to help clients improve body composition, since this can be one of the most efficient methods of expending energy during a training session.

Summary

The ACE IFT Model was created to meet the needs of an evolving fitness industry and the specific needs of a client population that is increasingly new to exercise. It is intended to accommodate program design for clients at every level along the health, fitness, performance continuum.

The ACE IFT model is a comprehensive blueprint for new and experienced trainers for successful exercise program design. It provides training on the foundational principle of building rapport in personal training to increase client retention and exercise adherence. Our goal is to help guide personal trainers through real world scenarios.

There are 2 training components in the ACE IFT Model with 4 phases each:

- Cardiorespiratory Training
 1. Aerobic – base Training
 2. Aerobic – efficiency Training
 3. Anaerobic – endurance Training
 4. Anaerobic – power Training
- Functional Movement and Resistance Training
 1. Stability and Mobility Training
 2. Movement Training
 3. Load Training
 4. Performance Training

These are the two primary training components of complete exercise programs. Each client has a unique entry point in each training component, and can progress and regress within each training component as needed.

Remember that you can find more detailed information about applying the ACE IFT Model in your personal training practice within the 4th edition of the ACE Personal Trainer Manual. We've also included resources within the online course that may interest you.

If you are not currently ACE certified and would like to learn more about our certifications, visit the [Fitness Certifications](#) section of our web site.

If you're already a certified professional, you can earn more CECs in our [Continuing Education](#) section and access cutting-edge resources, tools and education in the [Fitness Professional Resources](#) section.

Be sure to check out our [Get Fit](#) section as well, you and your clients will find a free exercise library, healthy recipes, fitness calculators and more!

Glossary

Aerobic	In the presence of oxygen.
Anaerobic	Without the presence of oxygen.
Center of Gravity	Also Center of Mass. The point around which all weight is evenly distributed.
First Ventilatory Threshold (VT1)	Intensity of aerobic exercise at which ventilation starts to increase in a non-linear fashion in response to an accumulation of metabolic by-products in the blood.
Glenohumeral (G/H) joint	The ball-and-socket joint composed of the glenoid fossa of the scapula and the humeral head.
Glycolysis	The breakdown of glucose or of its storage form, glycogen.
Heart Rate (HR)	The number of heart beats per minute.
Heart Rate Reserve (HRR)	The reserve capacity of the heart; the difference between maximal heart rate and resting heart rate.
Hypertrophy	An increase in the cross-sectional size of a muscle in response to progressive resistance training.
Interval Training	Short, high-intensity exercise periods alternated with periods of rest (e.g., 100-yard run, one-minute rest, repeated eight times.)
Kyphosis	Excessive posterior curvature of the spine, typically seen in the thoracic region.
Lactate Threshold	The point during exercise of increasing intensity at which blood lactate begins to accumulate above resting levels, where lactate clearance is no longer able to keep up with lactate production.
Lactic Acid	A metabolic by-product of anaerobic glycolysis; when it accumulates it increases blood pH, which slows down enzyme activity and ultimately causes fatigue.
Lordosis	Excessive anterior curvature of the spine that typically occurs at the low back (may also occur at the neck).
Maximum Heart Rate (MHR)	The highest heart rate a person can attain. Sometimes abbreviated as HRmax.

Mesocycle	The mid-length timeframe of a periodized training program, usually two weeks to a few months long. The goals of a mesocycle are designed to be steps on the way to the overall goal of the macrocycle.
Microcycle	The shortest timeframe in a periodized training program, usually one to four weeks long. The goals of a microcycle are short-term and are designed to be steps on the way to the overall goal of a mesocycle.
Minute Ventilation (V_e)	A measure of the amount of air that passes through the lungs in one minute; calculated as the tidal volume multiplied by the ventilator rate.
Mobility	The degree to which an articulation is allowed to move before being restricted by surrounding tissues.
Onset of Blood Lactate Accumulation (OBLA)	The point in time during high-intensity exercise at which the production of lactic acid exceeds the body's capacity to eliminate it; after this point, oxygen is insufficient at meeting the body's demands for energy.
Periodization	The systematic application of overload through the pre-planned variation of program components to optimize gains in strength (or any specific component of fitness), while preventing overuse, staleness, overtraining and plateaus.
Posture	The arrangement of the body and its limbs.
Rapport	A relationship marked by mutual understanding and trust.
Rating of Perceived Exertion (RPE)	A scale, originally developed by noted Swedish psychologist Gunnar Borg, that provides a standard means for evaluating a participant's perception of exercise effort. The original scale ranged from 6 to 20; a revised category ratio scale ranges from 0 to 10.
Second Ventilatory Threshold (VT2)	A metabolic marker that represents the point at which high-intensity exercise can no longer be sustained due to an accumulation of lactate.
Self-efficacy	One's perception of his or her ability to change or to perform specific behaviors (e.g., exercise).

Stability	Characteristic of the body's joints or posture that represents resistance to change of position.
Talk Test	A method for measuring exercise intensity using observation of respiration effort and the ability to talk while exercising.
Tidal Volume	The volume of air inspired per breath.
Transtheoretical model of behavioral change (TTM)	A theory of behavior that examines one's readiness to change and identifies five stages: precontemplation, contemplation, preparation, action, and maintenance. Also called stages-of-change model.
VO2 Max	Considered the best indicator of cardiovascular endurance, it is the maximum amount of oxygen (mL) that a person can use in one minute per kilogram of body weight. Also called maximal oxygen uptake and maximal aerobic capacity.
VO2 Reserve (VO2R)	The difference between VO2max and VO2 at rest; used for programming aerobic exercise intensity.

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