



An Overview of Functional Training

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AN OVERVIEW OF FUNCTIONAL TRAINING

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PART ONE: BACKGROUND

1.0 Introduction

“All human movement is a combination of various functions. Human movement cannot take place without muscular function.” (Cannone, 2004).

This article provides an overview of functional training from the perspective of exercise and fitness.

Functional training is a ‘fitness craze’ that has been ongoing for a number of decades, although the term functional training can be traced back to at least the 1970s (Inaba et al., 1973).

Although many may recognise functional training originating with the field of physical therapy (aiding with activities of daily living), there are commentators who suggest some sports and fitness personalities were utilising the concept of functional training before the term was coined.

Regardless of its origins, functional training, more accurately termed neuromotor exercise training (Garber et al., 2011), has subsequently grown into a huge business and, in Australia alone, there are over 70 exercise and fitness courses and modules relating to it, with an ever-growing number of qualifications/certifications.

According to IT Brief, LinkedIn (a business networking site) had 450 million members worldwide in 2016, of which 8 million resided in Australia (Barker, 2016). In 2017, 98,000 of these Australian members stated they had functional training as a skill (LinkedIn, 2017).

Defining functional training can be somewhat problematic as it means different things to different people, with some groups not even using the term functional training, instead referring to stability training, postural training or some other remote term.

As the reader will (hopefully) come to realise from reading this article, the underlying purpose of functional training is sound. However, for many, the meaning of functional training has been distorted/confused through the plethora of definitions, hybridisation and accretion of its original purpose.

This article will provide the reader with an outline of functional training within the context of the exercise and fitness industry. Section One provides a background to the topic which looks to define some of the terms used, highlight the myriad of definitions in use and offer a brief history. Section Two explains what is functional training, outlines the plethora of substitute terms and the purpose of it. Section Two continues with the role of functional assessments and links functional with stability, the components of fitness and training modalities. It will also outline some of the perceived benefits and paradoxes highlighted by some commentators, as well as the features one might expect to see within functional training and contraindications. Section Three outlines some of the qualifications on offer to fitness professionals and some of the factors to consider when deliberating on which qualification to pursue. Section Four highlights eight example exercises, including deficiencies/distortions to look out for. Section Five describes functional within the context of other industries. Finally, Section Six provides a summary of the article before providing the reader with some useful publications, links and references.

1.1 Aim

The aim of this article is to provide the reader with a broad, and fairly comprehensive, overview of functional training within the context of the exercise and fitness industry.

1.2 Defining the Terms

“The terms ‘functional training’ and ‘functional exercise’ are extremely vague – hence they can easily be interpreted to mean many different things and represent many different approaches to training.” (PT Direct, 2016).

This section of the article outlines some of the terms employed in functional training within the context of the exercise and fitness industry.

- ♣ **Function:** The online Cambridge Dictionary ([Cambridge University Press, 2017a](#)) has seven descriptions for the word function (six nouns and one verb), with two of the most pertinent outlined below:
 - Function (Noun) (Purpose): The natural purpose (of something) or the duty (of a person), e.g. The function of the veins is to carry blood to the heart.
 - Function (Noun) (Work): The way in which something works or operates, e.g. it’s a disease that affects the function of the nervous system.
- ♣ **Functional:** The online Cambridge Dictionary ([Cambridge University Press, 2017b](#)) has three descriptions for the word functional (three adjectives), with two of the most pertinent outlined below:
 - Functional (Adjective) (Useful): Designed to be practical and useful rather than attractive, e.g. functional clothing.
 - Functional (Adjective) (Working Normally): Performing a particular operation, e.g. a functional disorder (= when an organ does not work as it should).
- ♣ **Training** (Noun): According to the online Cambridge Dictionary ([Cambridge University Press, 2017c](#)) training means the process of learning the skills you need to do a particular job or activity, e.g. 1) a training course; 2) a teacher-training college; or 3) new staff have/receive a week’s training in how to use the system.
- ♣ **Movement:** The online Cambridge Dictionary ([Cambridge University Press, 2017d](#)) has three descriptions for the word functional (three nouns), with the most pertinent outlined below:
 - Movement (Noun) (Position Change): A change of position, e.g. her movements were somewhat clumsy.
- ♣ **Functional Movements:** Are movements based on real-world situational biomechanics. They usually involve multi-planar, multi-joint movements which place demand on the body’s core musculature and innervation. Simply put, functional movement is the ability to move the body with proper muscle and joint function for effortless, pain-free movement.
- ♣ **Fundamental Movement Skills:** They are the movement patterns that involve different body parts. They are the foundation movements or precursor patterns to the more specialised, complex skills used in play, games, sports, dance, gymnastics, outdoor education and physical recreation.
- ♣ **Functional Movement Systems:** Another way of saying functional movements.
- ♣ **Functional Activity:** Means ([The Free Dictionary by Farlex, 2017](#)) “a task or act that allows one to meet the demands of the environment and daily life.” or “An activity that is essential to support the physical, social, and psychological well-being of a person and allows that person to function in society.”

- ♣ **Functional Strength:** “Functional strength is the ability to run your load-joints (shoulders, hips, knees, and ankles) through a full range of motion without pain, stiffness, or restriction. This is also known as load-joint articulation.” (Chasey, n.d.).
- ♣ **Functional Strength Training:** “Functional strength training involves performing work against resistance in such a manner that the improvements in strength directly enhance the performance of movements so that an individual's activities of daily living are easier to perform.” (Bryant, 2011).
- ♣ **Functional Rehabilitation:** “The functional rehabilitation phase incorporates not only the traditional elements of physical therapy, such as strength and flexibility, but also activities to enhance agility, proprioception, and neuromuscular control.” (Lephart & Henry, 1995, p.579).
- ♣ **Functional Workout:** “For example, a squat is a functional exercise because it trains the muscles used when you rise up and down from a chair or pick up low objects. By training your muscles to work the way they do in everyday tasks, you prepare your body to perform well in a variety of common situations.” (Mayo Clinic, 2017).
- ♣ **Functional Exercise:** Another way of saying Functional Workout.
- ♣ **Functional Stability:** “Functional stability refers to the integration of both primary and secondary joint stabilizers to permit normal joint kinematics during dynamic activities.” (Lephart & Henry, 1995, p.580).
- ♣ **Activities of Daily Living (ADL):** Routine activities that individuals tend to do every day without needing assistance. There are six basic ADLs: eating, bathing, dressing, toileting, transferring (walking) and continence.
- ♣ **Instrumental ADLs:** Are not necessary for fundamental functioning, but they let an individual live independently in a community, e.g. housework; preparing meals; and taking medications as prescribed.

Now that the reader understands what the basic terms mean, one can transition to defining, from an exercise and fitness perspective, what functional training is (hopefully!).

1.3 A Plethora of Definitions

“Functional Training’ is a vague and often misused term.” (PT Direct, 2016).

One might be forgiven for thinking that something that has been around since the 1970s would be fairly easy to define; as the following suggest, perhaps not. Virtually everyone has their own version or take on what constitutes functional training and a few of these definitions are highlighted below:

- ♣ “Functional training is a classification of exercise which involves training the body for the activities performed in daily life.” (Wikipedia, 2017).
- ♣ “Functional training is defined as movements or exercises that improve a person’s ability to complete their daily activities or to achieve a specific goal. It is not a series of exercises deemed functional by some manual.” (DeFrancesco & Inesta, 2012, p.2).
- ♣ “Functional training is best described as a continuum of exercises that teach athletes to handle their bodyweight in all planes of movement. The coach uses bodyweight as resistance and attempts to employ positions that make sense to the participant.” (Boyle, 2010, p.2).
- ♣ “Functional training is purposeful training, grounded in universal principles.” (Morjaria, 2016).
- ♣ “Simply stated, the primary goal of functional training [from a functional strength training perspective] is to transfer the improvements in strength achieved in one movement to

enhancing the performance of another movement by affecting the entire neuromuscular system.” (Bryant, 2011).

- ♣ “Your body knows movements, not muscles, so using functional exercises that mimic natural, daily movements strengthens you for life. This can improve your whole-body strength and fitness, not to mention boost your metabolism.” (Welsh, 2017).
- ♣ “Functional training is a type of fitness training that involves conditioning muscles to help in everyday activities. Because the muscles used in common activities are the focus of the training, the actions used in functional training mimic those activities. For instance, functional training activities may include standing from a seated position or picking up common objects, such as clothing or cookware. The term is often applied in fitness, but it can also be applied in business, specifically to refer to training people to excel in their functional roles. Cross-functional training involves training for activities outside normal function, and normally applies to business.” (Linkedin, 2017).
- ♣ “Functional training helps provide you with the strength, stability, power, mobility, endurance and flexibility that you need to thrive as you move through your life and sports. You use basic functional movement patterns like pushing, pulling, hinging, squatting, rotating, carrying and gait patterns (walking and running) every day. Functional training utilizes exercises that improve your movement proficiency in these primary patterns to give you an edge and enhance your performance so you can achieve your goals safely and with good health.” (TRX Training, 2017).
- ♣ “Functional training is defined as movements or exercises that improve a person’s ability to complete their daily activities or to achieve a specific goal. It is not a series of exercises deemed functional by some manual. Doing movements in the gym that strengthen the muscles involved in the movements you wish to improve outside the gym is a good start.” (DeFrancesco, 2012).
- ♣ “Functional training is the use of exercises which involve complex, multi-joint movements of the upper body, core and lower body in each exercise. Just because the body CAN move in a given direction does not necessarily mean that it should be reinforced through repetitive movement patterns, with explosive tempo and/or heavy loads. We need more information before making such choices.” (NESTA, 2017).
- ♣ “Training to improve posture, movement efficiency and overall muscular performance related to various activities defines functional training.” (ACE, 2017).
- ♣ “But testing functional fitness leads to problems as the definition of what is actually “functional” can vary from task to task and person to person. “It really comes down to the definition of function,” says Eric Beard, founder of Eric Beard.com and a corrective exercise specialist. “If an exercise helps you climb stairs, lift boxes or breathe easier after chasing your kids, is it functional? Some like to look more specifically at speed of movement, plane of motion, body position and sequences of movements as driving function. Fitness masters Bruce Lee and Jack LaLanne, for example, were ahead of their time. They incorporated multiple aspects of training together. They performed ‘integrated training,’ which to me is a better term than ‘functional.’” (Agoglia, 2013).

The reader will no doubt notice recurring themes/words standing out from the above definitions which are explored further in [Section 2.12](#) (Features of Functional Training).

1.4 Manual of Functional Training

Originally published in 1980, the Manual of Functional Training by Lynn Palmer and Janice Toms provides advice to occupational therapists and students on evaluating the functional independence level of a handicapped person and assisting them in achieving the highest practical level of independence in ADL.

1.5 A Brief History of Functional Training

“Much of what I grew up doing as a young martial artist was what we would today call functional training.” (Santana, 2016, p.xii).

The term functional training can be traced back to at least the 1970s (Inaba et al., 1973) and Santana (2016) suggests that fitness personalities, such as Jack LaLanne and Bruce Lee, were using functional training techniques; it just wasn't called that at the time.

However, for most people, functional training has its origins in rehabilitation with physical therapists, occupational therapists and chiropractors often using this approach to retrain patients with movement disorders/injuries. Interventions were designed to incorporate task and context specific practice in areas meaningful to each patient, with an overall goal of functional independence (O'Sullivan, 2007).

From this rehabilitation standpoint, the idea was to prescribe exercises that mimicked what the patient did at home or work in order to aid them in returning to their lives or jobs after an injury or surgery. Practically this meant that if a:

- ✦ Patient's job required repeated heavy lifting, rehabilitation would be targeted towards heavy lifting;
- ✦ Patient was the parent of young children, rehabilitation would be targeted towards moderate lifting and endurance; and
- ✦ Patient was a marathon runner, rehabilitation would be targeted towards rebuilding endurance.

Considerations for rehabilitative treatments included the patient's condition, what they would be likely to achieve and ensuring the goals of treatment were realistic and achievable.

Santana (2016) informs us that during the 1980s functional training (fitness-wise) took a backseat to what is now considered traditional strength training (think Arnold Schwarzenegger) and “Although functional training systems never quite died, they were difficult to find.” (Santana, 2016, p.xii).

However, by the late 1980s/early 1990s, some “skill-dominated sports” wanted alternative training methods which had rehabilitation and performance improvement as their drivers rather than muscle-building (Santana, 2016, p.xii).

Consequently, the late 1990s/early 2000s witnessed an “explosion in functional training” (Santana, 2016, p.xii).

“What we thought were effective functional training methods 20 years ago now are rarely used, and what we thought were outdated and ineffective training methods now take center stage ... we are back to basics!” (Santana, 2016, p.xii).

Functional training really came to the fore in the 1990s when it was popularised by the media, or as Santana (2016, p.xiii) likes to present it “Welcome to the commercialization of functional training.”

PART TWO: FUNCTIONAL TRAINING AND EXERCISE AND FITNESS

2.0 Introduction

“Enter the era of confusion, where everyone is an expert, everything is functional, and nobody knows where the myths started.” (Santana, 2016, p.xiii).

This section of the article attempts to describe what functional training is, other names people use for it, and its contextualised role for different populations.

There is discussion about functional assessments, with an outline of one of the most well-known, and how they can complement traditional assessments.

The article moves on to describe how the components of fitness and training modality link with the concept of functional, before highlighting some of the benefits.

Finally, the article will outline some of the paradoxes and features of functional training before outlining any contraindications.

2.1 What is Functional Training?

“Neuromotor exercise training, sometimes called functional fitness training...” (Garber et al., 2011, p.1345) is one of four major components that are important in an individual’s health and fitness.

The American College of Sports Medicine (ACSM) in its, periodically updated, Position Stand the ‘Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guidance for Prescribing Exercise’ states:

“A program of regular exercise that includes cardiorespiratory, resistance, flexibility, and neuromotor exercise training beyond activities of daily living to improve and maintain physical fitness and health is essential for most adults.” (Garber et al., 2011, p.1334).

Neuromotor exercise training is a form of training that “incorporates motor skills such as balance, coordination, gait, and agility, and proprioceptive training. [and] ...is beneficial as part of a comprehensive exercise program for older persons, especially to improve balance, agility, muscle strength, and reduce the risk of falls.” (Garber et al., 2011, p.1345).

2.2 Other Names for Functional Training

Although officially termed neuromotor exercise training (Garber et al., 2011), functional training is also known by a variety of other names/titles including:

- ✦ Integrated training (Agoglia, 2013);
- ✦ Functional fitness training;
- ✦ Functional sports training (FST, 2017);
- ✦ Sport specific functional training (FAST Training, 2017);
- ✦ Functional exercise;
- ✦ Functional workout;

- ✚ Functional fitness; and
- ✚ Functional fitness exercise.

However, the generically vague term of functional training remains the most popular.

Fitness component (Section 2.8) variations include:

- ✚ Functional resistance training;
- ✚ Functional strength training;
- ✚ Functional weight training;
- ✚ Functional sprint training; and
- ✚ High-intensity functional training (HIFT) programmes (Section 5.6) (Haddock et al., 2016).

Functional training will be the term used throughout this article to avoid confusion.

2.3 The Purpose of Functional Training

“For many people, exercise is a way to maintain or improve their quality of life. And that’s the focus of functional fitness.” (Mayo Clinic, 2017).

Functional training is designed to train and develop an individual’s muscles to make it easier and safer to perform everyday ADL, which is contextual based on the population group in question, for example:

- ✚ Carrying groceries or playing a game of basketball/football with their kids for the general population.
- ✚ “Living in a safe and independent manner without undue fatigue” for older adults (Schoenfeld, 2010, p.5).

In order for the training to be considered functional it has to enhance the performance of ADL, recreational pursuits and/or sports performance.

In conjunction with the other major components of health and fitness (Section 2.1), functional training is designed to train beyond ADL (Garber et al., 2011).

2.4 Functional Assessments

“Fitness professionals planning to incorporate functional training exercises into their clients’ programs should first perform a functional assessment to guide exercise selection and provide a baseline for measuring progress.” (Beckham & Harper, 2010, p.25).

Beckham and Harper (2010) suggest that there are a variety of functional assessments which are reliable and easily administered, with some measuring specific components of overall function such as balance in contrast to others which adopt a more holistic approach. They also state that these tests are often population specific and have not been studied in different groups (i.e. young, elderly, sedentary, fit and athletic populations).

Fitness professionals should also note that ADL, job-specific tasks and sports activities will vary between individuals and is a relevant criterion when selecting an appropriate functional assessment.

Factors to consider with a functional assessment include (Beckham & Harper, 2010):

- ♣ Treating a functional assessment like any other fitness assessment by utilising a pre-screening tool, such as the Physical Activity Readiness Questionnaire (PAR-Q), to precede a functional assessment to determine if the test is safe and appropriate for the individual.
- ♣ Ideally linking to an exercise prescription template that guides the fitness professional with regards to:
 - Specific exercises;
 - Level of difficulty; and
 - Appropriate progression to target deficiencies.

There are a variety of functional assessments available to fitness professionals, with a variety of titles including functional fitness MOT programme (Later Life Training, 2014), functional fitness test, functional fitness assessment and functional fitness evaluation. Some of the more well-known functional assessments include (but not limited to):

- ♣ **Star Excursion Balance Test (SEBT):** Developed for use in individuals aged 20 to 39 years. This test measures body dynamic balance, strength, and proprioception. Helps identify asymmetries in balance between sides of the body.
- ♣ **Y Balance Test (YBT):** A tool used to test an individual's risk for injury. It can be used for both the upper quarter and lower quarter. The YBT for the lower quarter (LQYBT) has been thoroughly researched as its protocol is based on research done on the SEBT.
- ♣ **Berg Balance Scale (BBS):** Developed for use with older adults to measure static and dynamic balance during reaching, bending, transferring and standing activities.
- ♣ **Fullerton Advanced Balance Scale (FABS) assessment:** Is designed to measure static and dynamic balance in different sensory environments, including unstable surfaces, walking, stepping, and jumping in higher functioning older adults.
- ♣ **Senior Fitness Test (SFT):** Also known as the Functional Fitness Test (FFT), it was developed specifically to measure independent functioning in older adults aged 60 to 94 years. This seven-item test battery measures lower- and upper-body strength, aerobic endurance, lower- and upper-body flexibility, agility and balance.
- ♣ **VITTORIO Test:** Designed for assessing various components of ADL among patients in cardiac rehabilitation after cardiac surgery (Calsamiglia et al., 2005). The test consists of eight items that assess lower and upper extremity strength and flexibility, agility, dynamic balance, aerobic capacity.
- ♣ **APHERD (American Alliance for Health, Physical Education, Recreation & Dance) Functional Fitness Test:** Designed for adults over the age of 60 years. The test items are designed to measure the fitness capacity of the low fitness elderly who are not yet frail, and described in a test manual by Osness (1996).
- ♣ **Schlegel Functional Fitness Assessment (SFFA):** Developed in partnership with the Schlegel-UW Research Institute for Aging (RIA), uses wireless technology to assess an individual's balance, sway, strength and flexibility (Partington, 2015).
- ♣ **Fundamental Capacity Screen (FCS):** Observes four fundamental forms of movement energy expression and discusses how they interact with each other and the individual's environment to create sustainable movement fitness and movement health.
- ♣ **Selective Functional Movement Assessment (SFMA):** Utilises seven top-tier assessments, which are tests used to determine the breakouts to use to separate pain and dysfunction when possible, and will help identify movement patterns where exercise is indicated or contraindicated (Cook, 2017).
- ♣ **Functional Movement Screen (FMS):** refer to [Section 2.5](#) below.

Common elements tested/assessed/evaluated across the various functional assessments include:

- ♣ Upper body muscular strength;
- ♣ Lower body muscular strength;
- ♣ Muscular endurance;
- ♣ Aerobic endurance;
- ♣ Upper body flexibility;
- ♣ Lower body flexibility;
- ♣ Mobility and movement patterns;
- ♣ Body symmetry;
- ♣ Stability (e.g. core/trunk);
- ♣ Agility; and
- ♣ Static and dynamic balance.

Other elements specific to individual functional assessments include (but not limited to):

- ♣ Hand grip;
- ♣ Body composition;
- ♣ Arm and hand coordination;
- ♣ Sway;
- ♣ Jumping; and
- ♣ Unstable surface (linking to balance).

In simple terms, the purpose of a functional assessment is to test an individual's functional mobility and identify areas of weakness or imbalance. Within the context of the exercise and fitness industry, the functional movement screen is probably the most well-known and widely used functional assessment.

2.5 Functional Movement Screen

The Functional Movement Screen (FMS) has been designed to measure overall function in an active younger population.

This assessment analyses the ability to perform fundamental movement patterns such as the overhead squat, in-line lunge, hurdle step, shoulder reaching, straight leg raise, push-up, and rotational stability.

As a screening tool, the FMS is used to identify limitations or asymmetries in these fundamental movement patterns that are key to functional movement quality in individuals with no current pain complaint or known musculoskeletal injury.

These movement patterns provide observable performance of basic loco motor, manipulative and stabilising movements by placing an individual in extreme positions where weaknesses and imbalances become noticeable if appropriate mobility and motor control is not utilised.

Rather than quantify the number of repetitions or amount of weight lifted, quality of movement is assessed on a scale of 0 to 3 for each of the seven movement patterns based on compensation required to complete the task.

Simply put, the FMS is for asymptomatic individuals (i.e. no current pain complaint or known musculoskeletal injury) and the SFMA is for symptomatic individuals (i.e. when there is current pain complaint or known musculoskeletal injury) (Cook, 2017).

Research using the FMS assessment battery has focused primarily on athletic populations and firefighters. However, a study by Lisman et al. (2013) investigated associations between injuries and individual components of the US Marine Corps physical fitness test (PFT), self-reported exercise and previous injury history, and FMS scores. Their conclusions suggest that slow 3-mile run time (RT) was associated with increased injury risk (1.7 times more likely to experience an injury), and combining poor RT and low FMS scores significantly increased the injury predictive value (4.2 times more likely to experience an injury). Finally, Lisman and colleagues (2013) suggest that additional research is warranted to further clarify what combination of PFT and FMS tests are most suitable for predicting injuries.

Another study conducted in 2011 by some of the same researchers within the same setting (O'Connor et al., 2011) suggested there is an association between FMS scores and PFT scores. Overall, 79.8% of officer candidates with scores ≤ 14 (/21) were in the group with fitness scores < 280 (/300), whereas only 6.6% of officer candidates in the group with fitness scores ≥ 280 had scores ≤ 14 . There was also a higher injury risk among officer candidates who had scores ≤ 14 compared with those with scores > 14 .

2.6 Functional versus Traditional Assessments

Traditional fitness assessments should be used in conjunction with functional assessments because they provide valuable information for the fitness professional, however, they were not designed to measure ability to perform ADL, recreational activities or sports skills (Beckham & Harper, 2010).

For example, firefighters and law enforcement officers need good upper body strength to perform their job tasks effectively (Beckham & Harper, 2010). Thus, a one repetition maximum (1 RM) bench press test would allow assessment of upper body strength. However, good upper body strength alone does not necessarily infer good upper body functional capacity as mobility, stabilisation, or balance may be suboptimal, leading to poor body mechanics, injury, and possible disability.

In contrast, an individual with average upper body strength may actually have no problem performing functional tasks requiring upper body muscular endurance, mobility, balance, and stabilisation. Therefore, tests for both upper body strength and functional capacity would provide valuable information when assessing a firefighter.

The best assessments for an individual will depend on their goals, ADL, job tasks and any sports or recreational activities in which they participate.

2.7 Linking Functional with Stability

“Function varies from joint to joint. Exercises that promote the function of joints that require stabilization are different from exercises that promote the function of joints that strive for mobility. The primary function of certain muscles and muscle groups is stabilization, and functional training for those muscles involves training them to be better stabilizers, often by performing simple exercises through small ranges of motion.” (Boyle, 2016).

2.8 Linking Functional with the Components of Fitness

“Incorporating balance movements into cardio segments is a good way to cross-train because you’re combining skill-related components with health-related components of fitness.” (Kennedy-Armbruster & Yoke, 2014, p.280).

Just as there is confusion regarding functional training amongst fitness professionals, there is also disparity regarding the components of fitness. For example:

- ♣ [Brianmac.co.uk \(2017\)](#) suggests there four (4) components of fitness, but goes on to say that exercise scientists have identified nine (9) components of fitness, citing [Tancred \(1995\)](#).
- ♣ The US Army’s [goarmy.com website \(2014\)](#) suggests there are four (4) components of fitness.
- ♣ [Peloquin \(n.d.\)](#) suggests there are five (5) components of fitness;
- ♣ [CrossFit Lake Tahoe \(2017\)](#) and [Top End Sports \(2013\)](#) suggest there are ten (10) components of fitness; and
- ♣ [BIH Personal Training \(n.d.\)](#) suggests there are eleven (11) components of fitness.

Generally the components of fitness are divided into skill- and health-related components ([Kennedy-Armbruster & Yoke, 2014](#)):

- ♣ Skill-related components of fitness:
 - Agility (including acceleration, deceleration and change of direction);
 - Balance (including static and dynamic);
 - Coordination;
 - Power;
 - Speed; and
 - Reaction time.
- ♣ Health-related components of fitness:
 - Cardiorespiratory training (including aerobic and anaerobic);
 - Muscular strength and endurance (including core stability);
 - Neuromotor fitness (including balance, stability ([Section 2.7](#)) and mobility); and
 - Flexibility (including dynamic flexibility).

Whether an individual follows a training programme or not, if conducting fitness training they will no doubt utilise both skill- and health-related components of fitness during their training. This means there are a total of ten (10) main components of fitness, with linked sub-components, to consider during training.

Consequently, the components of fitness are intertwined with the concept and philosophy of functional training - as discussed in the features of functional training ([Section 2.12](#)) – and fitness professionals should be mindful of this when developing and delivering functional training.

2.9 Linking Functional with Training Modality

“Many would agree that oftentimes practitioners “lose the forest for the trees” in their quest for training functionality. For some it becomes more about the tools or gadgets than it is about the biomechanical skills and aspects of performance.” (Radcliffe, 2007, p.23-24).

The training modality utilised by the individual should be linked both to the components of fitness and desired training outcome. For example, an athlete competing in the 100 metres will require training in (but not limited to) agility, power, speed, reaction time, cardiorespiratory training and

muscular strength focused under the umbrella of sprint training. Being the fastest sprinter is irrelevant if the athlete cannot leave the blocks without injuring themselves or is unable to react quick enough to the starting signal.

Fitness professionals usually talk about strength, power, endurance, flexibility, and maybe stability when discussing training modalities (a generalisation but still a truism). However, for training to be functional it must also consider an individual's ADL, recreational pursuits and/or sports performance, as well as the skill- and health-related components of fitness.

Consequently, function must be linked with training modality to have validity and beneficial outcomes (Radcliffe, 2007), as discussed below:

- ✦ **Function of Warm-up:** Prepares the body and mind for performance, whether it be in training, practice or competition. Once an individual understands that athletic performance is dynamic in nature, then it becomes easier to understand that preparation for it must also be dynamic. Although a warm-up may be general in nature, it is an ideal time to utilise movements that optimise form, technique and the mobilisation of the same skills needed for an individual's ADL, recreational pursuits and/or sports performance.
- ✦ **Function of Core Training:** Is the foundation of all other strength work and all powerful movements begin with the core, subsequently your training should too. The first objective of core training is to develop the areas of the body that are responsible for the initiation and coordination of movement. Consider exercises that incorporate the elements of flexion, extension and rotation, as well as posture, balance, stability and mobility. "A functional core routine consists of dynamic movements, isometric exercises and challenges the centre of gravity." (DeFrancesco & Inesta, 2012, p.3) Traditional on the floor sit-ups may not incorporate these elements.
- ✦ **Function of Strength Training:** Strength is the ability to handle and move your body's weight, and any external loads necessary, for distances and speeds designated by competition, health and lifestyle. It is the ability to pull, squat and push the body against forces of gravity for desired success (Radcliffe, 2007, p.12-13):
 - Pull (athletic pulling begins with extension from the ground);
 - Squat (squatting fully); and
 - Push (in terms of functional training, pushing movements must be done from a standing position).
- ✦ **Function of Power Training:** The need for increased power (i.e. better utilisation of what is available for the body; functional strength; directional speed; and transitional agility) fits the profile of every athlete in some form. In order to increase athletic power, an individual needs to exhibit (Radcliffe, 2007, p.15):
 - Explosive strength and acceleration from a dead start;
 - Dynamic strength, coupling strength with the speed and use of counter-movements (i.e. the stretch-shortening cycle); and
 - An elastic-reactive rebounding ability over multiple response times (more simply put, the ability to be more like a bouncy ball rather than a squishy tomato!).
- ✦ **Function of Sprint Training:** The simplistic objective of sprint training is to get from point A to point B faster. Components of sprint training include (Radcliffe, 2007, p.18):
 - Proper rhythm;
 - Cadence;
 - Proper form;
 - Relaxation;
 - Strength;
 - Endurance; and

- Flexibility.

✦ **Function of Agility Training:** Training for agility involves the ability to change body position, position on a field or course of play, and/or avoid obstacles rapidly and accurately without losing balance. Most practitioners agree that this is dependent upon muscular power, coordination, mobility and reactive abilities. Agility requires dynamic strength, posture and stability. In general there are two manoeuvres to consider (Radcliffe, 2007, p.21):

- **Speed cuts:** These involve being able to change direction (or break), through direction changes of lesser angles, without deceleration and planting off of the inside (or direction side) foot; and
- **Power cuts:** These involve being able to change direction, through direction changes of greater angles, with major deceleration and planting off of the outside foot and then re-accelerating.

One of the most popular techniques touted to improve functional fitness is the use of unstable surface training, which includes wobble boards, foam rollers, stability balls, balance discs, BOSU devices, and so on.

“Many fitness professionals mistakenly refer to core and unstable training as functional training. They believe that if training emphasises working the core muscles or if the surface is unstable, such as when using a stability ball or disc, there must be positive carryover to a person’s performance of functional tasks. This assumption has been shown to be incorrect.” (Collins, 2012, p.7).

Although unstable surfaces are valuable in rehabilitation settings, there is a paucity of evidence regarding translating enhancements (e.g. activation of core musculature and improving proprioception in the lower body musculature) into better performance of ADL (Schoenfeld, 2010).

Schoenfeld (2010) argues that most ADL are carried out in a stable, rather than unstable, environment, with the additional criticism that unstable surface training often fails to take into account the concept of specificity or SAID (specific adaptation to imposed demands); i.e. the optimal transfer of the exercise benefit is achieved when movements most closely match those of a given task.

Research suggests that while training on a BOSU ball improved an individual’s ability to stand quietly, it failed to improve functional markers of strength, balance and power (Yaggie & Campbell, 2006). Schoenfeld (2010) also summarises other findings regarding unstable surface training such as being suboptimal for increasing strength, reductions in muscle activity and decreases in force output for both upper- and lower-body exercises.

This does not mean that unstable surface training does not have a role. McKeon and colleagues (2008) posit a combination of approximately 75% stable surface training and 25% unstable surface training may be ideal for optimising static and dynamic balance.

2.10 The Benefits of Functional Training

“To date, however, most studies were performed in athletic or senior populations and have not been validated in the average population.” (Beckham & Harper, 2010, p.25).

This was a view repeated by Garber and colleagues (2011, p.1345) “Few studies have evaluated the benefits of neuromotor exercise training in younger adults.” A number of studies looking at younger and military populations have been concluded and published since.

According to Richardson (2015) there are seven benefits to functional training, which may not quite be the benefits he suggests, as noted below:

1. **Movement:** According to Richardson, our bodies are designed to move, not to sit slumped over a computer all day. The less you move, the less blood sugar your body uses citing Yeager (2009). Functional training focuses on training movement patterns rather than isolating individual muscles. If you spend most of your working day sat down in the office, sitting on the chest press machine at the gym is probably counter-productive. Unfortunately, Richardson somewhat misrepresents Yeager, because in the article the answer to the effects of prolonged sitting isn't exercise (functional training or otherwise) it is to “Just ramp up your daily non-exercise activity thermogenesis — or NEAT. That's the energy (i.e., calories) you burn doing everything but exercise.” (Yeager, 2009).
2. **Posture:** According to Richardson, functional training can help to correct bad posture and muscular imbalances caused by the daily grind, stressful jobs and hectic lifestyles and cites Gambetta (2011) to back this claim. Gambetta talks about anti-gravity muscles, muscular imbalances and dynamic posture and never once uses the term functional training; (although not an uncommon practice), and what he states is consistent with the features of functional training (Section 2.12).
3. **Fat burning:** Provides fantastic fat burning workouts, by using full body exercises that improve strength, endurance and boost metabolism, not wasting a minute of your session. For this claim Richardson cites the ‘Fat Loss with Weight Training’ article on the Functional Fitness Blog (2012). The article (which doesn't mention functional training) mentions common features of this type of training which include: “It's hard”, “You will lift heavy weights” and “The exercise can break the anaerobic/lactate thresholds” which are features inconsistent with functional training (Section 2.12).
4. **Muscle tone/density:** Develops strong, lean bodies, look at gymnasts at the Olympics, they are constantly training movement patterns and lifting their own bodyweight, not doing bicep curls or pounding away on the treadmill for hours! For this claim Richardson cites a research study about muscle adaptations to aerobic training (Terjung, 1995) which does not mention training modalities (e.g. functional training).
5. **Stability:** Every session includes flexibility, mobility, core stability, balance and strength training principles to keep your body constantly challenged in all areas of a strong, healthy and vibrant body. For this claim Richardson cites Quinn (2016) whose article is ‘the best exercises for the core’, and this time we get a hit on functional. “Training the muscles of the core helps correct postural imbalances that can lead to injuries. The biggest benefit of core training is to develop functional fitness; the type of fitness that is essential to daily living and regular activities.” (Quinn, 2016).
6. **Sports specific:** Provides essential training for sport specific conditioning. Enhancing the relationship between the nervous and musculoskeletal system, providing quick, reactive, and powerful movement patterns - whether your chosen sport is golf, rugby or MMA. For this claim Richardson cites the well-known Michael Boyle (2016) who is linking functional training with stabilisation and multiplanar activity. The excerpt doesn't actually mention the relationship between the nervous and musculoskeletal systems.
7. **Core strength:** Every exercise involves core activation, teaching the core to stabilise the spine against external force, throughout an array of differing movement patterns and body positions. For this claim Richardson cites the Functional Resistance Training website (n.d.) and his brief summation reflects the content of the article.

There are also commentators who suggest that traditional training isn't much good, for example "So instead of sitting and doing a bicep curl where only the bicep is engaged (granted if you do a lot of these with heavy weights, you'll have big muscles and a weak core)..." [Republic Fitness \(2016\)](#). This comment assumes that individuals don't bother to exercise their core/abdominal muscles as part of the training programme, which is incorrect.

Moving on, a number of studies suggest there is a role for functional training in older adults ([Cress et al., 1996](#); [Whitehurst et al., 2005](#); [Anders, 2007](#)).

In these studies, subjects were generally assigned to either an experimental group (which would do functional exercises) or a control group (which would stick with a traditional exercise programme) and pretesting and post-testing performed for functional tasks involving flexibility, aerobic endurance, balance and agility. Activities during the study periods included balance and directional challenges, weight transfer activities and negotiating obstacles, as well as functional exercises such as wall push-ups, lunge and chop, and squat with diagonal reach. Across the studies, there were reported improvements for the experimental group which included lower-body and upper-body strength, cardiorespiratory endurance, agility/dynamic balance and flexibility. There were also self-reported improvements of physical functioning and fewer doctors' visits.

However, [Pacheco et al. \(2013\)](#) argue that: "Studies that have aimed to compare different strategies to improve functional capacity have produced controversial results. Furthermore, such studies have focused solely on dependent individuals." Consequently, [Pacheco and colleagues \(2013\)](#) decided to conduct a study comparing traditional training to functional training in healthy and independent middle-aged adults (40-60 years old) and elderly subjects (older than 60 years old). Their conclusions stated that there were no differences between the two protocols in their ability to improve functional capacity as measured by the two chosen outcome measures (observing changes between pre-test and post-test according to their intervention group, sex and age). As a caveat, Pacheco and colleagues stated that each subject's condition before the intervention must be considered and that some individuals may require additional basic training or specific training.

One study by [Peate et al. \(2007\)](#) studied the effects of functional training on injury rate and lost work time caused by injury in 433 firefighters (average age 42 years for men and 37 years for women). They implemented a programme that included instruction in proper body mechanics, exercises to improve core stability, and functional exercises that mimicked firefighting tasks. The number of injuries decreased 42% and lost work time caused by injuries declined 62% during the 12-month period after the training programme.

In another study ([Weiss et al., 2010](#)), the researchers attempted to determine whether functional training has similar effects as traditional resistance training on muscular strength and endurance, flexibility, agility, balance, and anthropometric measures in young adults. In this study, 38 healthy volunteers, aged 18-32 years, were randomly placed into a control group [traditional (n = 19)] and an experimental group [functional (n = 19)]. The participants were tested prior to and after completing the 7-week training study. The testing battery included: weight, girth measurements, flexibility, agility, lower back flexion and extension endurance, press-up test, sit-up test, one-leg balance, one-repetition maximum (1-RM) bench press and squat. Results indicated significant ($p < 0.05$) increases in press-ups, back extension endurance, 1-RM bench press, 1-RM squat, and one-leg balance within each group following training. Traditional training also elicited significant ($p < 0.05$) increases in bicep girth, forearm girth, calf girth, and sit-ups, while the functional training group experienced significant ($p < 0.05$) increases in shoulder girth and flexibility.

Forearm girth and flexion test time changes following training were the only parameter where there were significant ($p < 0.05$) differences between training groups.

Collectively, these results suggest that both programmes are equally beneficial for increasing endurance, balance, and traditional measures of strength. However, changes in various girth measures, torso flexor endurance and flexibility appear to be program-specific.

There is limited evidence suggesting that exercises involving balance and agility may have some role in reducing anterior cruciate ligament (ACL) injury in female athletes (Hewett et al., 2005) and male soccer players (Hrysomallis, 2007). The general consensus would suggest that balance training, as a single intervention, is not as effective as when it is part of a multifaceted intervention (e.g. jumping, landing and agility exercises).

In possibly the first study to examine the functional benefits of yoga in comparison with stretching-strengthening exercises in sedentary, healthy, community-dwelling older adults, Gothe and McAuley (2016) conclude that regular yoga practice is just as effective as stretching-strengthening exercises in improving functional fitness.

Within the US military, high-intensity functional training (HIFT) programmes have become increasingly popular, and include CrossFit, SEALFIT and the US Marine Corps' High Intensity Tactical Training (HITT) (Haddock et al., 2016). HIFT programmes (Haddock et al., 2016, p.e1508):

"...are designed to address multiple fitness domains, potentially providing improved physical and mental readiness in a changing operational environment. [with] The goal of HIFT programs is to produce high levels of cardiorespiratory fitness, endurance and strength that exceed those achieved by following current physical activity recommendations."

Although Haddock and colleagues (2016) recommend HIFT becoming the standard for military physical training, they observed that no large scale randomised trials comparing traditional military physical training with HIFT programmes on both health and injury outcomes had been conducted. The same researchers had announced earlier in the year they would be undertaking such a study (Poston et al., 2016). However, evidence from one US Army unit would suggest that functional training can reduce injury rates (Sutherland, 2013). Major Mark Ivezaj, who implemented the Mountain Athlete Warrior MAW) programme, stated "the brigade has seen a dramatic drop in injuries." (Sutherland, 2013).

"Researchers evaluated 596 male Soldiers before they began MAW training and about six months later. According to survey results, 29 percent of Soldiers reported experiencing injuries before beginning MAW. After starting the regimen, that number dropped by 10 percent. Overuse injuries -- wear and tear on shoulders, backs and knees -- decreased by six percent." (Sutherland, 2013).

In summation, the benefits of functional training can include (Cress et al., 1996; Whitehurst et al., 2005; Anders, 2007; Peate et al., 2007; Beckham & Harper, 2010; Boyle, 2016):

- ♣ Improve balance;
- ♣ Improve posture;
- ♣ Improve agility;
- ♣ Improve flexibility;
- ♣ Improve mobility;
- ♣ Improve muscle strength;
- ♣ Improve stability (core, hip and knee joints);

- ✚ Improve range of motion;
- ✚ Performance enhancement;
- ✚ Reduce the risk of falls (in older adults);
- ✚ Reduce the risk of injury; and
- ✚ Make everyday tasks easier (aka ADL).

“Definitive recommendations as to whether neuromotor exercise is beneficial in young and middle-aged adults cannot be made owing to a paucity of data, although there may be benefit, especially if participating in physical activities requiring agility, balance, and other motor skills.” (Garber et al., 2011).

There are a number of training modalities that can provide some, most or all of the above benefits, they are not the preserve of functional training.

Although there are numerous benefits to functional training, there are also some paradoxes which can disrupt the perceptions of trainers, coaches and fitness professionals.

2.11 The Paradoxes of Functional Training

Many functional training advocates will inform the reader that only multi-joint exercises are within the remit of functional training, with single-joint exercises of no or little value. However, Boyle (2016) would argue otherwise:

“At certain times, certain muscle groups—notably the deep abdominals, hip abductors, and scapular stabilizers—need to be isolated to improve their function. For this reason, some apparently nonfunctional single-joint exercises may in fact improve function of the entire lower extremity. This is one of the paradoxes of functional training.”

DeFrancesco and Inesta (2012, p.210) suggest that while the majority of a workout should be functional, “tossing in some safe, old-school basics can spice things up a bit and keep your client interested.”

Boyle (Human Kinetics, 2016) also highlights a second functional paradox which “revolves around multiplanar activity done in a sport-specific position.”

In this, Boyle is talking about loading athletes in positions of spinal flexion and provides the following example “...although a baseball player often squats to field a ground ball with a flexed spine, weighted squatting movements with the spine in a flexed position may not be wise.”

Boyle goes on to inform the reader that ““Many athletes have neglected strength training because they do not fully understand the performance-enhancing value of strength in sports such as baseball, tennis, or soccer.”

2.12 Features of Functional Training

“Neuromotor exercise training, sometimes called functional fitness, incorporates motor skills such as balance, coordination, gait, and agility, and proprioceptive training.” (Garber et al., 2011).

Features one might reasonably expect to see in a functional training programme include (DeFrancesco & Inesta, 2012; Beckham & Harper, 2010; Boyle, 2016):

- ♣ A functional movement screen/assessment prior to commencing any functional training.
- ♣ After a functional movement screen/assessment, programme design should first focus on areas of movement deficiency and/ or posture distortion:
 - Identifying movement deficiency/distortion (dependent on the trainer's understanding of anatomy, motor patterns and muscle function).
 - Start with the most basic movement patterns that could not be completed. For example, before adding lunge movements to an individual's exercise programme, they should first be able to perform a squat properly.
 - Next, the focus should move to areas with asymmetries, which is supported by research studies showing an increased risk of injury when asymmetries are present.
 - Finally, design should focus on the next lowest scored task and most basic movement patterns. If an individual cannot complete basic movements, then more complex movements will elicit only further compensation.
- ♣ Designed to specifically enhance the performance of ADL, recreational pursuits and/or sports performance, and not just improve strength.
 - The training programme should link to the exercises which in turn link to the needs/outcomes of the individual;
 - Should be progressive (steadily increasing the difficulty of the tasks or simple smaller targeted movements to more complex multi-joint movements);
 - Should be periodised; and
 - Repeated frequently.
- ♣ Targets the neuromuscular system, meaning it trains movements (muscle groups and the nervous system) and not just the muscles.
- ♣ Uses a progressive and individualised programme of primarily weight-bearing, multi-joint and multiplanar exercises.
 - The majority of exercises should be conducted standing up.
 - The majority of exercises should be multi-joint.
 - A minority of exercises should be single-joint (using simple exercises through small ranges of motion) focusing on muscles and muscle groups whose primary function is stabilisation which need to be isolated to improve their function, for example:
 - The core (deep abdominals);
 - Hips (hip abductors); and
 - Posterior shoulder (scapular stabilisers).
 - Use of real life object manipulation, where practicable.
 - [DeFrancesco and Inesta \(2012, p.211\)](#) suggest "include full body movements as they progress from floor exercises and focus on mastering body weight before adding resistance. Once a person has demonstrated they are ready to do more difficult exercises, start to incorporate multi-tasking exercises."
 - As a starting point, stages include ([DeFrancesco & Inesta, 2012, p.212-213](#)):
 - Stage 1: Geared towards correcting postural issues, teaching form, defining exercise boundaries, and addressing balance and faulty motor patterns. Repetition ranges will vary from six to ten at slow tempos and low intensity.
 - Stage 2: Similar to stage 1 but less static exercises and increasingly difficult exercises at a faster tempo and slightly more intensity. Repetition ranges can be higher with ten to fifteen repetitions.
 - Stage 3: Should have more dynamic movements at a moderate intensity and include super-setting and challenging environments.
 - Stage 4: Should be difficult, full-body, multi-joint and proprioceptive exercises. Intensity is based on goals.
- ♣ Includes challenges to improve dynamic and static balance, coordination and proprioception.

- ✦ Involves the integration of the nervous system, muscles that produce joint movement, as well as the muscles responsible for stabilisation.
- ✦ Advice on functional movements including the causation (inadequate core or back stabilising muscle strength, poor flexibility and improper body mechanics) and prevention of injuries.
- ✦ Feedback should be incorporated following performance (self-feedback of success is used as well as trainer/therapist feedback).

“To create a functional program, a trainer must set realistic goals and understand the client’s weaknesses, daily activities and limitations.” (DeFrancesco & Inesta, 2012, p.2).

Finally, one must remember that there are four components to consider when developing a programme:

“A program of regular exercise that includes cardiorespiratory, resistance, flexibility, and neuromotor exercise training beyond activities of daily living to improve and maintain physical fitness and health is essential for most adults.” (Garber et al., 2011, p.1334).

There are a number of fitness providers who offer generic functional training programmes/regimens which do not necessarily offer any form of:

- ✦ Screening/assessment prior to commencement;
- ✦ Individualisation to the client (due to its generic nature);
- ✦ Consideration regarding the client’s performance of ADL, recreational pursuits and/or sports performance; and/or
- ✦ Progression (meaning from simple single-joint exercises to complex multi-joint, multi-planar movements).

This would appear to go against the features of functional training. As noted below this could be a basis for contraindication.

2.13 Functional Training and Contraindications

“However, Beard cautions that it is important to make sure that participants are physically ready for functional, HIIT and CrossFit classes before they even begin. The biggest challenge facing fitness professionals when trying to implement functional training techniques is actually the deconditioned state and poor posture of their client base,” he says. “Kettlebells and training ropes are fun for fit pros and clients alike, but when the client has poor movement patterns and a weak core, these tools can be contraindicated.” (Agoglia, 2013).

PART THREE: QUALIFICATIONS

3.0 Qualifications Offered

*“A training program built around actions that do not occur in sport simply does not make sense.”
(Boyle, 2016).*

As with any other aspect of exercise and fitness, your fitness professional should operate within their scope of practice and expertise. Simply put, we mean they should hold appropriate qualifications from appropriate training providers/authorised awarding bodies.

There are several organisations offering continuing education courses (CECs, also known as continuing professional development (CPD)) and qualifications/certifications within the field of functional training, which are generally accredited by an awarding body/regulator. These organisations include (but are not limited to):

- ✦ The Functional Training Institute offers The Master Functional Trainer certification which comprises a 3 stage process which the trainer/coach completes to gain a status as an expert in the field of functional training.
- ✦ The National Exercise and Sports Trainers Association (NESTA) offers the Functional Training Specialist qualification.
- ✦ The American Council on Exercise (ACE) offers a one-day Functional Training and Assessment Workshop.
- ✦ The (Australian) Fitness Network offers the Elite Functional Trainer certification.
- ✦ Functional Movement.com offers the Functional Movement Screening & Corrective Exercise: Level One and Level Two Home Study courses.
- ✦ The Fitness Institute Australia (FIA Nation) offers the Functional Training - Strength Training Level 1 and 2, and the Functional Training and Advanced Core Conditioning courses.
- ✦ Future Fit Training offers a Functional Equipment Training workshop.
- ✦ Certified Functional Strength Coach.
- ✦ Certification in Applied Functional Science offered by the Gray Institute.

Fitness Australia, the peak fitness body in Australia, advertises 70+ courses (March, 2017) relating to functional training.

3.1 Factors to Consider

The content of the plethora of qualifications/certifications/modules available to fitness professionals can vary by provider and one should be wary of purchasing based on price alone.

Thus, when a fitness professional is considering a functional training qualification they should consider a number of factors, including (but not limited to):

1. Who is the training provider. Are they a known name.
2. Training medium (e.g. face-to-face, online or blended).
3. Cost of the course.
4. Course content, for example:
 - a. Why screen?

- b. Administration, development and supervision of screening across a range of disciplines and sports.
 - c. Identifying movement deficiency/postural distortion (dependent on the trainer's understanding of anatomy, motor patterns and muscle function).
 - d. Undertake risk analysis of activities.
 - e. Screening results and how they impact programming.
 - f. Develop and apply corrective exercise strategies and utilise exercise selection to improve the individual's fundamental movement baseline.
 - g. Administration, development and supervision of training programmes across a range of disciplines and sports.
 - h. Teach exercise applications and techniques to improve the individual's training results.
5. Course objectives/outcomes, for example:
- a. Display a specialised knowledge of functional screening and resistance training.
 - b. Display key concepts supported by theoretical frameworks and models.
 - c. Exhibit a range of practical skills that are consistent with best practice in the area of functional screening and resistance training.
 - d. Formulate exercise and training programmes based on sound scientific principles.
 - e. Act in a range of varied and specific contexts involving routine activities.
 - f. Conduct a needs analysis for an individual or group and devise an appropriate response.
 - g. Assess own learning and identify needs within a structured learning environment.
 - h. Express an internalised personal view and awareness of the social, ethical and legal issues within a support role within functional training.
6. What are the formative and summative assessment, testing and/or exam procedures.
7. Who is the awarding body.
8. CEC/CPD points awarded for successful completion. This generally demonstrates the course has been externally validated by a recognised awarding body/regulator.

Simplistically, the qualification should give the fitness professional the skills and knowledge to develop custom assessment, treatment and training programmes tailor made for each unique individual (aka the client). These skills and knowledge may be gained from one qualification or from a range of qualifications/courses/modules which may lead to an umbrella qualification and, perhaps, confer some form of title such as those identified in [Section 3.0](#).

PART FOUR: EXAMPLES OF FUNCTIONAL TRAINING EXERCISES

4.0 Introduction

“The problem with what has been accepted as functional in the fitness industry is that it is based on our idea of functional, and not the client's idea of functional.” (PT Direct, 2016).

Although written by a fitness professional (PT Direct, 2016), the article ‘Function Fitness: What the Heck is It?’ provides some though provoking questions regarding functional fitness from a client perspective. The author argues that:

“For ‘functional training’ and ‘functional exercise’ to have a practical and useful meaning for personal trainers they must have a client centric element and be oriented on meeting the needs and wants of every individual client. This means that ‘functional’ will change from client to client.”

The author further argues that “exercises are only functional when they relate directly to the clients goals, the client is capable of doing them and will happily repeat them often enough for results to happen.” These comments are consistent with the features of functional training (Section 2.11).

With this in mind, we can now look at some example exercises which can be classified as functional training based on their relevance in enhancing the performance of ADL, recreational pursuits and/or sports performance of the individual.

4.1 Eight Example Exercises

There are a variety of functional training exercises available to trainers and their clients, with eight outlined below. These exercises are useful for both evaluation purposes and basic skill/movement development.

Functional Exercise 01: Hip Hinges

🦋 Description:

- Hold a pole against back of head and tail bone.
- Client may bend knees to get lower (but should not end up performing a squat!).

🦋 Check for:

- Correct technique: keep spine straight by hinging at the hips.
- Incorrect technique: Spine bends forward putting low back in a harmful position.

🦋 Progression/Alternatives:

- Master this before doing any weights.
- This is not so much a test as a way for the client/trainer to identify poor bending mechanics.
- This movement is important because it promotes a neutral spine.

Functional Exercise 02: Press-up (aka Push-up)

🦋 Description:

- Have client perform a press-up.

🦋 Check for:

- Trapezius elevation (tight upper trapezius/weak lower).
- Scapular winging; medial border (weak serratus).
- Scapular winging; inferior angle (weak rhomboid).
- Scapular adduction (tight rhomboid/weak pectorals).
- Poor lumbopelvic stability (weak core).
- Delay scapular movement (poor proprioception).

🦋 Progression/Alternatives:

- Serratus press-up.
- Knee press-up.
- Plank (aka bridge).

Functional Exercise 03: Crossovers

- ♣ Description:
 - Start in a press-up position.
 - Feet wider than shoulder width apart.
 - With back straight, touch one hand to the other and return to starting position without shifting your body.
 - Immediately do the same thing with the other hand and continue to alternate.
 - This will test trunk stability.
- ♣ Check for:
 - Unable to keep neutral spine.
 - Trapezius hiking.
 - Scapular winging.
 - Hip rotation.
- ♣ Progression/Alternatives:
 - Plank.
 - Disc crunch.
 - Low chop.

Functional Exercise 04: The Squat

- ♣ Description:
 - Start with feet shoulder width apart and squat down.
- ♣ Check for:
 - Knees caving in (tight adductors).
 - Hyperpronation (weak intrinsic foot muscles).
 - Can't get to 90 degrees (tight hips and hamstrings).
 - Leans forward (weak trunk/poor hip stability).
 - Hip drops (weak glute medius).
 - Patella sheer (weak hips/quad dominant).
 - Pelvic shift (poor hip stability).
- ♣ Progression/Alternatives:
 - Squat to front press (aka squat to overhead press):
 - Hold the weight (e.g. dumbbells) at shoulder level and stand with feet shoulder width.
 - Squat as low as you can without losing the arch in your lower back.
 - Come back up and press the weights overhead.
 - Foam roller squat.
 - Peterson step up.
 - Glute bridge.

Functional Exercise 05: One Leg Stance

- ♣ Description:
 - Have client pick up one leg (also conduct test with eyes closed).
- ♣ Check for:
 - Pelvic shifting; hip dropping (weak glute medius).
 - Pelvic swaying (weak glute medius and core).
 - Knee shaking (weak politeus, calf and/or quad).
 - Hyperpronation of foot (weak peroneals and intrinsic foot muscles).
 - Weak glute medius causes opposite side low back pain.

- ♣ Progression/Alternatives:
 - Balance boards.
 - One leg medicine ball catch.
 - Chops.

Functional Exercise 06: Side Plank/Bridge Endurance Test

- ♣ Description:
 - Have client perform a side plank/bridge.
 - This test will reveal shoulder/core weaknesses.
- ♣ Check for:
 - How long the client can hold it; 30 to 45 seconds is passing time for this test depending on sex and age.
 - Hip dropping.
 - Hyperextension of low back.
 - Shoulder shrugging.
 - Inability to extend hip.
 - Kyphosis (exaggerated outward curvature of the thoracic region of the spinal column resulting in a rounded upper back).
 - Shoulder pain.
- ♣ Progression/Alternatives:
 - Knee planks.
 - Dead bug on roller.
 - Corkscrew.

Functional Exercise 07: Dead Bug with Foam Roller (No Arms)

- ♣ Description:
 - Place roller along the spine, plant the feet on the floor and hold a neutral spine.
 - Pick up one foot and stabilise with the other foot.
- ♣ Check for:
 - Knee shaking.
 - Trunk shaking.
 - Unable to hold position.
 - Inversion of foot.
 - Eversion of foot.
 - Back pain.
- ♣ Progression/Alternatives:
 - Glute bridging.
 - Clams.
 - Plank.

Functional Exercise 08: Lunge

- ♣ Description:
 - Start with feet shoulder width apart.
 - Step forward with knee bent and lower back knee toward floor, keeping neutral spine.
 - Return to start and continue with opposite leg.
- ♣ Check for:
 - Knee adduction/shaking/pain (tight adductors).
 - Pronation of foot (weak intrinsic foot muscles).

- Leaning forward (weak core/glute maximus).
 - Pause on return (overall lower body weakness).
 - Unable to reach floor with back knee (tight quads).
 - Patella sheer (poor hip mobility).
- ‡ Progression/Alternatives:
- One leg balance exercises.
 - Supported static lunge.
 - Split squat.

PART FIVE: FUNCTIONAL AND OTHER INDUSTRIES

5.0 Functionalism: Beyond Fitness

Functional training isn't just confined to exercise and fitness, a whole host of industries have adopted the functional philosophy such as academics, business and foodies.

5.1 Functional and Academics

“Functional academics is merely academics made functional designed to teach skills which allow each student to succeed in real-life situations at home, school, work and in the community.”
(SPASTN, 2011).

Students are taught several skills which include ADL and skill oriented activities (SPASTN, 2011).

Educators have a variety of terms including:

- ‡ Functional Academic Skills Training (FAST);
- ‡ Functional Academics;
- ‡ Functional Applied Academics;
- ‡ Functional Academic and Life Skills Classes; and
- ‡ Academic Training – Functional Element.

5.2 Functional and Foods

There are also functional foods, first introduced/termed in Japan around the mid-1980s.

A functional food is a food given an additional function (often one related to health-promotion or disease prevention) by adding new ingredients or more of existing ingredients (food components) (Zeratsky, 2015; AFF, 2017).

Some functional foods are generated around a particular functional ingredient, for example foods containing probiotics, prebiotics, or plant stanols and sterols.

Proponents of functional foods say they promote optimal health and help reduce the risk of disease because they have a potentially positive effect on health beyond basic nutrition.

The medical definition of functional food is ([Medical Net, 2016](#)):

“A modified food that claims to improve health or well-being by providing benefit beyond that of the traditional nutrients it contains. Functional foods may include such items as cereals, breads, beverages that are fortified with vitamins, some herbs, and nutraceuticals.”

5.3 Functional and Business

“Functional business strategy is an area of operational management based on a specific department or discipline within an organization, such as human resources, finance or marketing.”
([Bradley, 2017](#)).

Common functional areas in businesses (aka areas of speciality) include sales, marketing, finance and accounting, customer service, human resources, research and development, production and distribution.

5.4 Functional and Recruitment and Selection

Some organisations are also adopting the concept of functional in their physical fitness tests and work fitness assessments, as part of the employment process.

For example, the [Maryland State Police \(2017\)](#) in the US utilises the Functional Fitness Assessment Test to measure an applicant’s level of fitness and physical preparedness for police work through the following standards:

- ✚ Push-Ups (aka Press-ups): eighteen (18) in one minute.
- ✚ Sit-Ups: twenty-seven (27) in one minute.
- ✚ Flexibility: approximately 1.5 inches beyond toes (while seated).
- ✚ 1.5 Mile Run: maximum time of 15 minutes and 20 seconds (15:20).

The Australian Border Force utilise the functional fitness assessment (FFA) as part of the their recruitment process, and has been designed with two outcomes in mind ([Sonic HealthPlus, 2017](#)):

1. To give a representation of an applicant’s overall fitness; and
2. Will relate to the requirements for the role.

The FFA was “designed in conjunction with the Department of Immigration and Border Protection to accurately assess the fitness requirements for Operational Safety Training (OST). It evaluates several key areas of fitness including:

- ✚ Flexibility and Spinal Mobility
- ✚ Core Stability
- ✚ Aerobic Capacity /Cardiovascular Fitness
- ✚ Agility
- ✚ Power
- ✚ Upper Body Strength and Endurance
- ✚ Lower Body Strength and Endurance
- ✚ Manual Handling Skills” ([Sonic HealthPlus, 2017](#)).

The FFA conducted for International Space Station crewmembers can be found here: [[DOCUMENT: Example Functional Fitness Assessments](#)].

As part of the employment process employers may assess a potential employee's functional work capacity through a work fitness assessment (also known as a pre-employment functional capacity evaluation, musculoskeletal assessment or functional fitness evaluation) which provides comprehensive information relating to a potential employee's physical strength and cardiovascular fitness to understand if they can perform the tasks required within a job role (Jobfit, 2017).

The coal mining industry of Australia commissioned a detailed study (conducted by the Queensland University of Technology) with the aim of developing functional fitness measures related to the work practices of underground coal miners, and consequently produced two (health- and work-related) protocols (Parker, 2007).

5.5 Functional and Medicine

“Functional Medicine is a personalised, systems-oriented model that empowers patients and practitioners to achieve the highest expression of health by working in collaboration to address the underlying causes of disease.” (IFM, 2017).

Functional medicine addresses the whole person (patient-centred) rather than the traditional medical practice of identifying an isolated set of symptoms (disease-centred).

5.6 Functional and the Military

A number of military services (e.g. US and British armed forces) have adopted the concept of functional training within their various physical training programmes.

For example, the US Army in its publication 'FM 7-22 Army Physical Readiness Training', last updated in October 2012, makes frequent mention of functional movements and how they apply to the components of fitness (Section 2.9).

“Performing movements with correct posture and precision improves physical readiness while controlling injuries.” (US Army, 2012, p.2-5).

The publication numerous mentions functional movements, functional strength, functional mobility and functional endurance and how they contribute to the individual soldier's physical readiness.

“Soldiers are only as strong as their weakest link; so all these muscles must be trained in a manner that mimics their function.” (US Army, 2012, p.6-11).

High-intensity functional training (HIFT) programmes, known by some as extreme conditioning programmes, designed to address multiple fitness domains have also become very popular, especially in the US. CrossFit, SEALFIT and the US Marine Corps' High Intensity Tactical Training (HITT) are well-known versions.

PART SIX: MISCELLANEOUS

6.0 Summary

Functional training has been around since the 1970s but it still causes confusion for both fitness professionals and clients alike. Despite cogent definitions from respected sports science organisations, a variety of ‘industry experts’ continue to provide their own definitions with a wide variance of interpretation.

The basic purpose of functional training to the fitness enthusiast is to enhance the performance of activities of daily living, recreational pursuits and/or sports performance. Some training providers, regardless of the need to tailor exercises to the client and ensure they are screened for any movement deficiencies/postural distortions, continue to offer generic programmes to all and sundry. This is inconsistent with the features of functional training.

Within the scope of a programme of regular exercise, functional training should not be conducted without consideration for cardiorespiratory, resistance and flexibility training. However, some training providers now ‘tout’ functional training programmes that encompass all four of these major components within one session or appear to suggest that functional training is a panacea; which would seem inconsistent with the definition and features of functional training.

Alongside confusion amongst fitness professionals surrounding functional training, there is also confusion regarding the components of fitness and how they should synergise with functional training. There are six skill-related and four health-related components of fitness, intertwined with each other and a number of sub-components - but evidence demonstrates variance in knowledge ranging from four to eleven components. This will undoubtedly affect a fitness professional’s ability to provide sound functional training.

It is important that fitness professionals and their clients undertake a functional screen/assessment prior to starting a functional training programme, with clients asked to complete a PAR-Q (or equivalent form). The screen/assessment can then be used to identify any movement deficiencies/postural distortions and inform appropriate exercise selection. In line with any other fitness training programme, baseline and progress assessments need to be conducted, with progression and periodisation built in. Initially, simple exercises should be utilised to develop skill, rather than just throw a client into complex multi-joint, multiplanar exercises which may exacerbate any movement deficiencies/postural distortions because the exercise is too technically difficult or physically strenuous.

Prior to 2010/2011, a significant proportion of research focused on dependent older adults or athletic populations. However, there is now a growing body of research incorporating non-dependent older adults, firefighters, younger persons and military populations. Although the jury is still out on whether functional training is inferior, as effective or superior to traditional training, there are reported benefits, especially in dependent older adults. If functional training can improve balance, posture, agility etc.; improve performance; and reduce the likelihood of injury, then it should be applauded.

There is a growing body of courses, qualifications, certifications and modules for fitness professionals related to functional training. Fitness professionals should ensure they attend a

course, delivered by an approved training provider, which grants CEC/CPD points on successful completion; meaning it will have been externally validated by a regulating body.

During exercise selection, fitness professionals should consider exercises to deliver an enhancement in the performance of activities of daily living, recreational pursuits and/or sports performance for the individual, as well as their expectations of the training and its outcome(s).

Functional is not the preserve of the exercise and fitness industry, with a number of other industries partially or fully engaged in the concept.

The aim of this article was to provide the reader with a broad, and fairly comprehensive, overview of functional training within the context of the exercise and fitness industry; an aim, I will hope you will agree, I have achieved.

6.1 Personal Notes

From a personal perspective, writing this article has provided me with clarity on a subject I didn't actually know much about prior to writing!

Am I a convert? I would like to think so. I now understand what functional training is and its role within the realm of fitness and the continuum of an individual's journey through life.

I now understand that as a training mode it has important value, but it must not sit within a training vacuum. With a holistic lens, I must incorporate it with not only cardiovascular, stability and resistance training, but also consider the clients desires, fitness goals and lifestyle (amongst others).

As a consequence of writing this article, I am now going to enrol on a functional training course to officially upskill and gain a recognised qualification.

6.2 Useful Publications

👤 Books:

- Boyle, M.J. (2010) *Advances in Functional Training: Training Techniques for Coaches, Personal Trainers and Athletes*. Aptos, California: On Target Publications.
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6.3 Useful Links

- ♣ YouTube:
 - What is Functional Training?: https://www.youtube.com/watch?v=PosZYMx_iBs.
 - Functional Training: <https://www.youtube.com/watch?v=6JK2PjPVFQE>.
- ♣ Functional Training Institute: <http://functionaltraininginstitute.com/>.
- ♣ National Exercise and Sports Trainers Association (NESTA): <https://www.nestacertified.com/>.
- ♣ American Council On Exercise (ACE) Functional Training & Assessment Workshop: <https://www.acefitness.org/certifiednewsarticle/2326/functional-training-what-it-means-for-your-clients/>.
- ♣ (Australian) Fitness Network Elite Functional Trainer certification: <http://www.fitnessnetwork.com.au/Education/functional-trainer/home>.
- ♣ Functional Movement: http://functionalmovement.com/store/online_courses.
- ♣ Fitness Institute Australia (FIT Nation): <https://www.fiafitnation.com.au/cec-pdp-courses/functional-training/functional-training-strength-training-level-1>.
- ♣ Fitness Australia (Functional Training courses): <http://fitness.org.au/courses/category/functional-training/97>.
- ♣ Future Fit Training (Functional Equipment Training workshop): <http://www.futurefit.co.uk/future-fit-training/courses/intergrated-equipment-training/>.
- ♣ Gray Cook Movement: <http://graycookmovement.com/>.
- ♣ Selective Functional Movement Assessment (SFMA) Flowcharts: <http://www.humanmotion.nl/uploads/categories/1395742785-SFMAFlowcharts-0214.pdf>.
- ♣ The Gray Institute: <https://www.grayinstitute.com/>.
- ♣ Certified Functional Strength Coach: <http://www.certifiedfsc.com/>.
- ♣ Institute for Functional Medicine (IFM): <https://www.functionalmedicine.org/>.

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