

PERSONAL FITNESS TRAINER MANUAL



fundamental theory and practical application for the personal trainer



6th Edition



Study and Reference Manual

The Fundamentals

for the

Certified Personal Trainer, CPT

Sixth Edition © 2014

All rights reserved,
National Federation of Professional Trainers

Authors:

Ron J. Clark, NFPT President & Founder
Mark P. Kelly, PhD
Charles DeFrancesco, CPT

Co-Authors:

Dr. Robert Inesta
Scott Skinner, RD
Stewart Bauserman, MS

A special thank you to Contributors:

Chris Petraglia, CPT
Richard Weinstein MD
Steve Sarno BS, LMT
Felix Doval, CPT
Denise Groothuis, RD
Thom Theis, PT
Raymond A. Winkleman, CPT
James H. Holt MA, CPT
Angie Christine Schweigert, Rick Veteto,
Dan DeFigio, Rona Thau, Gene Kelly
and Illustrator: Jason Vega

TABLE OF CONTENTS

CHAPTER 1 Understanding Health and Wellness8 Components of Wellness	CHAPTER 10 Aerobic and Low Level Activity 160 The Metabolic Continuum Monitoring Aerobic Exercise Intensity Aerobic Training Program
CHAPTER 2 Basic Human Anatomy 14 Overview of Body's Major Systems	CHAPTER 11 Cross Training and Enhancing Sports Skills for the Athlete 170 Strength and Power Cardiorespiratory Training Flexibility Training Sport Activity
CHAPTER 3 Anatomical Terms and Biomechanics 22 Anatomical Positioning Biomechanical Movement Planes of Motion Bones and Joints Connective Tissue: Tendons, Ligaments, Fascia Prime Movers: Major Skeletal Muscles Muscle Groups The CORE	CHAPTER 12 Resistance Training 180 Why Resistance Training? The Basics: Resistance Training Resistance Training Guide Muscle Strength & Endurance: the intersection Overload Training Principle Between Set Recovery Considerations Antagonistic Multi-Set Training Principle Training Tips Back Conditioning Considerations Contraindications to Exercise: The Basics
CHAPTER 4 Skeletal Muscle: Structure and Function 54 Muscle Tissue Types Skeletal Muscle: A Closer Look Contraction Types, Overloads, and Force Delivery Muscle Fiber Types Motor Unit Recruitment: The Size Principle Contractile Failure	CHAPTER 13 Program Design: Charts & Tables 202 General Exercise Recommendations Suggested Movements & Total Sets/Rep Range Chart Total Activity Expenditure and Calorie Needs General Dietary Advice Metabolic Rate: the hidden factor Supplements
CHAPTER 5 Cardiac and Smooth Muscle: Structure and Function 76 Links in the Cardiac Chain Blood Flow Pulmonary and Systemic Circulation: An Overview Exercise and Muscle Function Blood Movement Understanding Blood Pressure Oxygen, Carbon Dioxide, and Nutrient Movement	CHAPTER 14 Client Screening & Consultation 222 Order of Operations Pre-exercise Screening and Risk Classification General Client Information and Risk Assessment Understanding Assessment Variables PERFORMANCE VARIABLES NON-PERFORMANCE VARIABLES Major Risk Factor Identification General Client Information Re-Evaluate
CHAPTER 6 Physiology of Nutrient Metabolism 88 The Digestive Process Fuel Sources for Metabolism Muscle Fiber Type and Metabolic Functions The Mechanisms for Carbohydrate Metabolism The Glycemic Index and Glycemic Load The Mechanisms for Fat Metabolism The Mechanisms for Protein Metabolism	CHAPTER 15 Client Programming, Stretches and Exercises 248
CHAPTER 7 Metabolic Pathways and Energy Production 102 Body Tissue Protein Measurement Body Tissue Energy Production Aerobic vs. Anaerobic Pathways The Cycle of Events: Citric Acid Cycle Fat Oxidation in Aerobic Metabolism Activation of Catabolism Roles of Hormones in Energy Production Fuel Usage vs. Exercise Duration VO ₂ max Applied	CHAPTER 16 Special Populations 260
CHAPTER 8 Nutrient Review 112 Essential Nutrients for the Human Body Supplements vs. Real Food Vitamins and Minerals Water: The Most Essential Nutrient Distribution of Water in the Body Fluid Intake	CHAPTER 17 Injury Prevention and Management 268
CHAPTER 9 The Beginner Client 130 A Summary of Terms: Fitness Concepts and Training Principles 5 Components of General Fitness The General Fitness Exercise Program Flexibility, Stability and Core Strength Fundamental Core Routine Core Progression STRETCHING Stretching Principles and Types Cramps and Fasciculations	CHAPTER 18 Client Troubleshooting 276
	CHAPTER 19 Legal and Marketing for Personal Training 286
	PROFESSIONAL DOCUMENTS 297 Fitness Participant Disclosure Agreement Informed Consent Waiver Liability Waiver Physician's Exercise Release
	CONSULTATION GUIDELINES 301 Questionnaire Procedure Client Consultation Information Form Par-Q & You Form Cardiovascular Risk Profile Basic Movement Assessments
	NFPT CHARTS and TABLES 317
	MASTER FOOD LIST 319

INTRODUCTION

The National Federation of Professional Trainers (NFPT) would like to welcome you to the world of personal training! Interestingly enough, the personal training industry is only about 40 years old. Personal training started with only a small number of people who were either preparing for a serious bodybuilding competition, or employed by wealthy elite; obviously, a lot has changed since the introduction of personal training into mainstream fitness – personal training is now a booming multi-billion dollar business. You can hardly step foot into a gym, at any hour of the day or night, and not see someone working with a personal trainer. You'll also see trainer's clients in all types of shapes and sizes, with vastly different goals and needs. This isn't a one size fits all business. As a personal trainer, you will need to use a variety of exercises, motivational techniques, and business logic to be successful in this profession.

About NFPT

NFPT was founded in 1988 with a mission, in part, to provide foundational, comprehensive and applicable education to aspiring personal fitness trainers. This NFPT Study and Reference Manual has been designed around fundamental exercise science concepts and independent research that will complement current trainer knowledge at any level of fitness experience or academic background. NFPT education strives to equip personal trainers with tools and resources that add to the development of individual trainer skill sets. Successful completion of the NFPT certification program will provide you with an industry recognized credential that supports your ability to offer safe and effective fitness training services to apparently healthy individuals.

Since 2005, NFPT's personal trainer certification program has been accredited by the National Commission for Certifying Agencies (NCCA). Accreditation of the NFPT personal trainer certification program assures highly esteemed recognition, authority and reliability of the NFPT certification credential in the fitness industry. NFPT policies and processes for examination development and delivery, organizational governance, certification maintenance and more have been reviewed and approved by third party standard setting organizations. NFPT will continue to support industry wide efforts that further public and government respect, trust and confidence in fitness trainer certification.

Manual Scope and Organization

This manual is designed to provide you the tools that are essential to being a personal trainer. It is not meant to be a complete scientific study, but rather a tool for learning the fundamental elements and methodologies of personal fitness training. We'll cover the aspects of health, fitness and the human body that will make for a well-rounded and comprehensive experience through this learning material. NFPT does offer various continuing education courses so that you can go deeper into the learning of specific subject areas, but, with this manual, we will strive to give you the step-by-step learning of the concepts that will keep your personal training safe, effective and successful.

The NFPT Study and Reference Manual is a recommended tool for exam preparedness because it provides a foundation for learning and a reinforcement of necessary trainer skill sets. We highly recommend that you are familiar with the exercise principles and concepts that are provided in this text because they are important to successful job performance; however, understand that the NFPT Certified Personal Trainer (CPT) exam is an all-encompassing assessment that is derived from industry research and on-the-job expectations of personal fitness trainers, it is not constructed from one textbook exclusively; therefore, NFPT encourages a variety of educational resources for developing and growing in your profession.

The NFPT – CPT exam, and respective credential, acts as a measurable demonstration of your fitness training knowledge, skills and abilities (KSAs). This NFPT Study and Reference Manual will try to keep things simple and focused on what will aid you in being a successful personal trainer. It has not been designed specifically for the purpose of passing the certification exam. The focus of this manual is *personal trainer responsibilities*, or a **scope of practice**, that includes the following:

- enhancement of overall health and well being to the apparently healthy population that is appropriate for the individual
- identification of potential risk factors associated with exercise, using protocols for medical release or referral when needed
- implementation of appropriate fitness program based on physical screening, health consultation, consistent evaluation and reasonable goals of the client
- promotion of the safe and effective use of fitness equipment, techniques and program design
- application of fundamental exercise science and fitness program design principles in a one on one or small group setting
- motivation, support and teaching of clients and fitness enthusiasts in an effort to improve levels of fitness and maintain an enhanced health and well-being

What is a personal trainer?

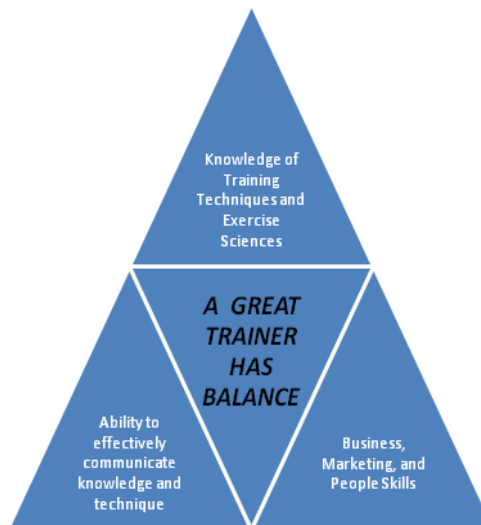
Before we get started on the knowledge and concepts that you should be familiar with as a NFPT Certified Personal Trainer (CPT), we want to discuss what it means to be a NFPT – CPT , “what is the role of a personal trainer”?

Let’s start here...

A personal fitness trainer is a health and fitness professional possessing the knowledge, skills and abilities for safe and effective exercise and fitness program design, instruction and assistance for the purpose of training his or her client to reach personal health and fitness goals.

Now, thanks to television shows and celebrities who hire personal trainers, the career of the personal trainer has a high profile in today’s culture. Unfortunately, the depiction of this profession is often distorted and/or misunderstood. For example, some people judge a trainer only by how he or she looks when, in actuality, things like passion, purpose, caring and coaching are key qualities, above most others, in fitness professionals. A focus and work ethic, driven by the qualities that motivate you, and coupled with the right credentials, education and experience, will have the biggest positive impact to long-term success in the fitness industry. To help you recognize your future role as a personal trainer, be familiar with your **scope of practice** and follow the procedures that are permitted as standard for the certified personal fitness trainer. As the result of your learning and growth in the fitness profession, through education and training, you should be able to successfully and consistently demonstrate the following:

1. Knowledge of human anatomy and the concepts of functional exercise, basic nutrition and basic exercise science
2. An ability to design individual and group exercise programs tailored to the needs of specific clients
3. An ability to conduct and understand the need and importance of screening and client assessment, initially and progressively
4. An ability to execute individual fitness program design in a safe and effective way
5. A desire to help clients reach their health and fitness goals through appropriate cardiovascular, flexibility and resistance exercise
6. An ability to motivate others to improve their overall fitness and health
7. A dedication to maintaining integrity and your own personal health and fitness



A good personal trainer delivers safe, effective, fun and interesting workouts (in that order) to all fitness training clients. The training programs you develop should be varied and progressive, and geared toward improving your clients' health and wellness. As a trainer, you should be enthusiastic and supportive, so that your clients remain interested and stimulated, which helps ensure they stick with the program – and with you. While personal trainers often assume multiple roles with their clients, including being a coach, cheerleader and sometimes confidant, there are some things that personal trainers should avoid. For example, it is NOT expected or appropriate for a personal trainer to:

1. Give medical advice, physical therapy advice or attempt to make a medical diagnosis
2. Provide more than general nutritional advice
3. Provide body massage to clients
4. Serve as a psychological counselor to clients
5. Have a romantic relationship with a client
6. Push personal preferences for fitness goals on clients who do not seek out those same goals
7. Push product or extended services for financial gain that is not in the overall best interest or demonstrable benefit to the client

Avoiding these areas mentioned will help you to stay within your scope and maintain a high degree of professionalism as a personal trainer.

After Certification: Continuing Education

As a certified fitness professional, you will need to meet certain continuing education requirements after the initial certification process in an area that you take interest in; this will help you to stay current in the fitness industry, advance your skills and knowledge base, and learn new approaches to fitness training.

Continuing education (CE) acts to evaluate and validate the continued competency of a trainer's current, applicable knowledge; it is a necessary part of personal and professional development. Many times, this may simply mean attending educational workshops, conferences and/or courses. Giving attention and consistency to your professional development will keep you current, refreshed and is extremely beneficial to your career. CE is more than just a recertification requirement - it means going beyond the initial CPT credential to serve your clients in the best way possible. At NFPT, we do offer our own in-house CE programs and processes that will keep your certification on track and current.

Whether you take a NFPT CE course, or not, we encourage you to stay within your personal training scope of practice at all times. While you may know some tips and tricks in one specialty area or another, without the proper education and/or credential for dispensing such advice, you will put yourself and your clients at risk. Remember, a certified personal trainer is an expert on the “healthy side” of the equation; you are not a nutritionist, massage therapist or guidance counselor unless you have taken the proper courses and earned the respective title for your specialty area. Continuing to learn is an essential element to ensure that you make the safest and most effective programming choices, and for your long-term success as a personal trainer.

The Evolution of Personal Training Education

There will always be new ways of looking at the same subject, especially as new knowledge and technology is discovered. The field of exercise goes through these perspective shifts as well; but, a lot of times, we notice that these shifts involve a ‘going back to basics’ philosophy. For example, the term “functional training” or “functional exercise” is being applied to many areas now. Some of these “functional” programs are really just complex, destabilized training that is not truly functional; yet there are other programs that do address the human system in a logical, stepwise manner and can be considered truly “functional”. By definition, functional training focuses on movements or exercises that improve a person’s ability to complete their daily activities or to achieve a specific goal. Therefore, success with this type of training is best established by first going back to basics, as is the case in all specialty areas.

As a personal trainer, you need to build your fitness knowledge on foundational properties that keep your “house” firm and grounded. Avoid jumping into a rush to train someone using the techniques of the latest popular trend without first being fully comfortable with basic principles. Listen and understand the individual needs of the client, you will most often find that it is the foundational fitness principles that will best assist him or her in reaching their goals. Just like in the nutrition field, where more and more attention is being focused on the individuality of the client/patient and how they respond to a given nutrient, exercise or lifestyle change, personal training is also about the individual. It is this careful attention to the individual client that warrants the term “personal” training.

The fitness industry has transitioned back to basic training equipment and apparatus as well, and for good reason. Free weights, heavy ropes, suspension and body weight training devices, dumbbells, balls, tubes and bands are all simple but effective ways to develop functional movement and promote weight loss as well as tone muscles. But, as you know, or will learn in this course, no matter what equipment you use, the client must first be assessed. The “personal” aspect of training should come before the actual training; you have to start by getting to know the needs, limitations and realistic goals of your client. We will provide you with the tools and the information that you need to properly assess your clients - but, remember, as a personal trainer, you have a very high level of responsibility, and liability, that must be taken into account every time that you take on a new client. You are working with a very complex “machine”, the human body, and the more that you know about how it “runs” for your client, the better off you and your client will be.

To be sure that your clients are ready and able to begin a training program, use professional assessment documents like the “Cardiovascular Risk Profile” and the “PAR-Q & You” forms as a starting place for uncovering any areas of concern with your clients. These assessment documents, and others, will be covered in the Consultation Guidelines section of this manual. It is often these simple client assessments that will detect weakness and imbalances, and that will keep you and your clients safe. After a general health assessment is done, and you’re given the “good to go” from the assessments, the physician’s release and the client waiver of liability, it’s time for a fitness assessment using the basic training elements that will guide you in establishing a sound baseline for where your client is currently, and where you want to take them in the future.

After you have completed your thorough assessments of health and readiness, and after you have developed a fitness activity plan/program, it will then be time to start addressing the basic issues of postural alignment and how to get the most out of the movements by using the proper form. You may even want to consider specialty areas of training for techniques like myofascial release and corrective exercise that may be beneficial for your clients. There are also specialty areas for heavy lifting programs that include core training, balance training, and multi-joint muscular endurance training that would be good for you to know when working with a specific client base.

This manual addresses the areas that we consider to be fitness fundamentals; we will keep a focus on the skills and knowledge areas that will assist you in being a better trainer, above all else. Of course, there is a revolution of sorts in the fitness industry, given the amount of available technology at our fingertips. Fitness consumers have all kinds of product available to them that will do everything short of shrinking down their trainer to miniature size to put in their pocket and take everywhere they go – there’s probably an app for that! Then there are videos and video games, offering the convenience of an at-home fitness atmosphere to appeal to the video age that we now live in; though fitness videos have been available to consumers for decades, they are an entirely different animal now and more available in an instant. Just remember this: the evolution of this industry through technology will never replace a person – hence, the “personal” trainer. It will no doubt make fitness programming and tracking a much more convenient thing to do for the consumer, and for you as well – so you would do well to learn and embrace the tools that new technologies have afforded us – but no matter the fancy gadgetry, you will always be able to better determine what a client needs individually and how to motivate them to get it; an app can’t stream inspirational consciousness and personal accountability.

Remember, the job of a good trainer is to deliver a safe, effective, fun, and interesting workout (in that order). So, very basically, your job is to keep your clients from injury and to give them a workout that actually improves their health and performance, is fun for them to do, and stimulates their interest to keep coming back and trying new things and exploring new areas or activities.

If you are reading this education manual so that you may better prepare for the NFPT personal trainer certification exam, we recommend the additional reading of the ‘NFPT Exam Content Outline’ as a checklist for your studies. This document is an outline of the specific subject matter that you can expect to find on the NFPT - CPT exam; it is located within the supplemental NFPT Study Guide for your convenience. Please note that this manual will cover some of the many intricacies of the make-up, systems and functions of the human body so that you may have a more well-rounded understanding of how our bodies work. This does not mean that memorizing the higher level science concepts or fine prints of the provided charts and tables will benefit you directly on the exam; but we do believe that a deeper level approach to some of the more science-based subjects will give you a greater cognitive understanding and appreciation for health, the human body and the respective successes of your fitness conscious clients.

We can’t teach all of the qualities that will make you a successful personal trainer, some of these are inherently you – like enthusiasm, leadership, dependability and trustworthiness. If these characteristics describe you and who you strive to be, and you have the desire to keep learning and growing, then you are already on your way to being a great personal fitness trainer - now let’s get started!