

Personal Trainer Knowledge, Skills, and Abilities (1/01/12)

1. Core Knowledge

- A. Kinesiology: Anatomy and Biomechanics
- B. Exercise Physiology
- C. Basic Nutrition and Weight Management
- D. Human Behavior

2. Health and Medical Review; and Fitness Assessment

- A. Health History Review
- A. Current Health Conditions Review
- B. Health-Related Fitness Appraisal

3. Fitness Training: Design, Implementation, and Evaluation

- A. Fitness Goal Setting
- B. Safe and Efficient Exercise
- C. Program Design: Cardiorespiratory, Strength, and Flexibility
- D. Program Evaluation

4. Professional Responsibilities

- A. Standards of Practice
- B. Leadership Techniques
- C. Basic Business Principles

1. Core Knowledge

A. Kinesiology: Anatomy & Biomechanics

- 1.A.1 Knowledge of basic anatomy of the cardiovascular and respiratory systems and the interactions that form the cardiorespiratory system
- 1.A.2 Knowledge of structural components of the musculoskeletal system (bone, skeletal muscle, and connective tissues) and muscles that comprise major muscle groups
- 1.A.3 Knowledge of terms related to anatomical positions and movement: superior, inferior, proximal, distal, medial, lateral, anterior, and posterior
- 1.A.4 Knowledge of three planes of movement (sagittal, transverse, frontal)
- 1.A.5 Knowledge of terminology related to joint movement: flexion, extension, hyperextension, adduction, abduction, rotation, circumduction, supination, pronation, inversion, eversion, elevation, depression, dorsi flexion, and plantar flexion
- 1.A.6 Knowledge of and ability to classify three types (skeletal, smooth, cardiac) of muscle tissue in the body
- 1.A.7 Knowledge of roles muscles can assume (agonist, antagonist, stabilizer, and neutralizer)
- 1.A.8 Knowledge of four unique properties of muscle tissue: excitability, contractibility, extensibility, and elasticity
- 1.A.9 Knowledge of three major types of muscular contractions (isometric, isotonic, and isokinetic) and the two types of isotonic contractions (concentric and eccentric) and their use in training
- 1.A.10 Knowledge of biomechanical movement patterns associated with common activity modes (i.e., walking, jogging, swimming, cycling, resistance training, etc.)
- 1.A.11 Knowledge of biomechanical guidelines for resistance training for maintaining strength and good posture
- 1.A.12 Ability to identify and locate joint actions produced by major muscles and muscle groups responsible for gross motor movement
- 1.A.13 Ability to identify opposing muscle groups
- 1.A.14 Ability to identify two-joint muscles
- 1.A.15 Ability to identify joint actions occurring in each plane of movement
- 1.A.16 Ability to identify muscles and joint actions involved in specific exercises

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B. Exercise Physiology

- 1.B.1 Knowledge of the health-related components of fitness
- 1.B.2 Knowledge of health benefits achievable through all types of physical activity
- 1.B.3 Knowledge of the acute response of the cardiovascular system (heart rate, stroke volume, cardiac output, a-v O₂ difference, blood pressure, VO₂) to exercise
- 1.B.4 Knowledge of typical resting vs. exercise values for factors involved in VO₂
- 1.B.5 Knowledge of characteristics of cardiorespiratory training (aerobic and anaerobic) and related physiological adaptations at rest and during submaximal and maximal exercise
- 1.B.6 Knowledge of the physiologic process for muscular strength gains and the adaptations that occur as a result of resistance training
- 1.B.7 Knowledge of the mechanisms of flexibility training (muscle spindles, Golgi tendon organ, stretch reflex)
- 1.B.8 Knowledge of Sliding Filament Theory of muscle contraction
- 1.B.9 Knowledge of 3 energy systems: Phosphocreatine, Anaerobic Glycolysis, and Aerobic
- 1.B.10 Knowledge of cause of delayed onset muscle soreness
- 1.B.11 Knowledge of various fuel sources within the body and how they are mobilized during physical activity
- 1.B.12 Knowledge of factors that can be assessed through metabolic exercise testing
- 1.B.13 Knowledge of various clinical and field methods for assessing or estimating VO₂ max
- 1.B.14 Knowledge of three types of skeletal muscle
- 1.B.15 Knowledge of the adaptations to cardiorespiratory, resistance, and flexibility training across populations
- 1.B.16 Knowledge of adaptations to exercise environment (heat, cold, altitude, etc.) by the body during exercise training
- 1.B.17 Ability to identify causes of and apply strategies for delaying fatigue during aerobic and anaerobic exercise
- 1.B.18 Ability to identify the energy system that predominates for different types of physical activity tasks
- 1.B.19 Ability to identify skeletal muscle fiber type characteristics, measurement of muscle fiber type, and influence of fiber type on exercise performance potential
- 1.B.20 Ability to perform calculations related to assessing or estimating VO₂

C. Basic Nutrition and Weight Management

- 1.C.1 Knowledge of essential nutrients; and ability to list caloric value, function, major food sources, and RDA
- 1.C.2 Knowledge of roles and mechanisms of carbohydrate, fat, and protein with regard to aerobic and anaerobic metabolism
- 1.C.3 Knowledge of nutrition/disease link across various medical conditions (osteoporosis, coronary artery disease, certain cancers, metabolic conditions) and nutrients to increase/decrease to reduce disease risk
- 1.C.4 Knowledge of resting metabolic rate and basal metabolic rate and its relevance to weight management
- 1.C.5 Knowledge of antioxidants and their possible role in disease prevention
- 1.C.6 Knowledge of public healthy eating tools such as current US Dietary Guidelines for Americans and MyPlate
- 1.C.7 Knowledge of how to use MyPlate to estimate current caloric intake, target caloric intake, and requirements from the different food groups
- 1.C.8 Knowledge of what constitutes a 'serving' of grains, fruit, vegetables, dairy, healthy oils, and meat/beans
- 1.C.9 Knowledge of common eating disorders and factors related to the female athlete triad
- 1.C.10 Knowledge of effects of megadosing with certain vitamins and minerals
- 1.C.11 Knowledge of ergogenic aids' effects on physical performance and their potential risks
- 1.C.12 Knowledge of reliable sources of nutrition and weight management information
- 1.C.13 Knowledge of exercise program guidelines for weight control/management
- 1.C.14 Knowledge of inappropriate weight loss methods
- 1.C.15 Skill in recommending general nutritional guidelines for healthy adults to gain general health benefits according to US Dietary Guidelines within scope of practice

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- 1.C.16 Skill in recommending general nutritional guidelines for healthy adults to achieve favorable body composition results within scope of practice
- 1.C.17 Skill in recommending general nutritional guidelines for healthy adults to enhance sports performance within scope of practice
- 1.C.18 Ability to use methods of estimating an individual's resting metabolic rate (RMR) and basal metabolic rate (BMR) and apply results in program design for weight management
- 1.C.19 Ability to use the energy balance equation to achieve goals (weight loss, weight management, weight gain) within an appropriately defined amount of time
- 1.C.20 Ability to perform basic calculations related to nutrient intake and caloric expenditure

D. Human Behavior

- 1.D.1 Knowledge of behavior change process and its importance in exercise adherence
- 1.D.2 Knowledge of adult learning styles and their impact on the adoption of new behaviors
- 1.D.3 Knowledge of research-based methods and techniques of motivating human behavior and performance
- 1.D.4 Knowledge of effective goal setting and behavior reinforcement techniques
- 1.D.5 Knowledge of methods/products available in the industry to increase adoption of physical activity
- 1.D.6 Skill in using communication techniques (active listening, empathy, open-ended questions, feedback) to build effective change relationships
- 1.D.7 Skill in understanding and leveraging an individual's actions/reactions to bring about positive behavior change
- 1.D.8 Skill in planning and designing programs to promote the development of exercise confidence
- 1.D.9 Skill in identifying individual motivation cues to maximize motivational techniques
- 1.D.10 Skill in identifying individual learning styles and adapting strategies to meet learning needs
- 1.D.11 Ability to classify and respond to individuals by stage of behavior change using the Transtheoretical Model of Behavior Change and apply stage-appropriate strategies
- 1.D.12 Ability to help an individual identify their barrier(s) to making positive behavior changes; and skill in assisting them to address/remove barrier(s)
- 1.D.13 Ability to identify and use adherence strategies for long-term maintenance of healthy behaviors

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2. Health and Medical Review, and Fitness Assessment

A. Previous and Current Health Conditions Review

- 2.A.1 Knowledge of purpose and goals of reviewing an individual's previous and current health conditions
- 2.A.2 Knowledge of sophisticated vs. practical screening techniques; ability to discern in which setting they are most appropriate
- 2.A.3 Knowledge of the causes and effects of common respiratory, cardiovascular, metabolic, and skeletal/muscular conditions that warrant further evaluation by a medical professional prior to exercise participation
- 2.A.4 Knowledge of major and contributing coronary risk factors and cut points indicative of risk (example: ATP-III Guidelines for blood cholesterol levels, JNC-7 Guidelines for resting blood pressure) and methods of reducing risk factors
- 2.A.5 Knowledge of American College of Sports Medicine's absolute and relative contraindications to exercise testing
- 2.A.6 Knowledge of common medications used to reduce coronary risk factors and the medication's effect on heart rate at rest and during submaximal and maximal exercise
- 2.A.7 Knowledge of effects of common pharmacological agents (example: antianxiety/depression medications, antihistamines, bronchodilators, weight loss medications) on physical activity
- 2.A.8 Knowledge of various body fat measurement methods and the relative advantages/disadvantages of each method
- 2.A.9 Knowledge of common postural deviations and associated bone/skeletal muscle involvements
- 2.A.10 Knowledge of common assessments used to measure range of motion and to identify postural abnormalities
- 2.A.11 Knowledge of impact of acute or chronic skeletal and muscular conditions on exercise testing and design
- 2.A.12 Skill in soliciting and recording information used to assess and evaluate health and fitness status
- 2.A.13 Skill in measurement of resting blood pressure and heart rate
- 2.A.14 Skill in methods of measuring body composition (skinfold calipers and waist circumference measurement)
- 2.A.15 Skill in use of measurement devices to obtain and record various body measurements
- 2.A.16 Ability to apply current national Physical Activity Guidelines to determine if an individual currently meets physical activity recommendations
- 2.A.17 Ability to determine appropriate screenings for individuals based upon previous and current conditions
- 2.A.18 Ability to calculate and classify Body Mass Index results for men and women
- 2.A.19 Ability to compare individual and total risk factors to evaluate relative risk in individuals and populations
- 2.A.20 Ability to categorize an individual's risk level based upon the ACSM Risk Stratification System
- 2.A.21 Ability to administer the Physical Activity Readiness Questionnaire
- 2.A.22 Ability to explain and administer an Informed Consent
- 2.A.23 Ability to recognize common postural deviations
- 2.A.24 Ability to identify skeletal and muscular factors or conditions that may require input from a qualified healthcare provider prior to exercise testing and design
- 2.A.25 Ability to recognize acute conditions that require referral to a healthcare provider

B. Health-Related Fitness Assessment

- 2.B.1 Knowledge of the terminology, purpose, and procedures for current methods of assessing cardiorespiratory, strength, and flexibility fitness levels
- 2.B.2 Knowledge of criteria for terminating a fitness assessment test
- 2.B.3 Skill in administering fitness assessment tests
- 2.B.4 Skill in instructing individuals in the performance of fitness assessment tests
- 2.B.5 Ability to perform basic mathematical calculations to solve basic cardiorespiratory and fitness formulas required during the assessment of fitness status
- 2.B.6 Ability to apply and interpret statistical norms to determine cardiorespiratory, strength, and flexibility fitness levels
- 2.B.7 Ability to identify and implement appropriate modifications for fitness testing based on known characteristics (obesity, balance problems, age, etc.)

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3. Fitness Training: Design, Implementation, and Evaluation

A. Fitness Goal Setting

- 3.A.1 Knowledge of the purpose of and appropriate criteria for goal setting
- 3.A.2 Knowledge of change over time guidelines for setting cardiorespiratory fitness, absolute and dynamic strength, flexibility, and body composition goals
- 3.A.3 Ability to apply principles of Goal Setting Theory to creation of goals
- 3.A.4 Ability to create goals based on normative data
- 3.A.5 Ability to create goals based on percent change data
- 3.A.6 Ability to recognize and translate desired outcomes into challenging, realistic, and measurable (SMART) goals
- 3.A.7 Ability to work collaboratively with individuals to set goals based upon fitness assessment outcomes and individual desires
- 3.A.8 Ability to calculate percent change between assessment periods and assess goal attainment

B. Safe and Efficient Exercise

- 3.B.1 Knowledge of purpose and mechanisms of proper warm up and cool down techniques
- 3.B.2 Knowledge of proper breathing techniques while performing cardiovascular, strength, and flexibility exercises
- 3.B.3 Knowledge of safety rules and procedures for cardiorespiratory, strength, and flexibility activities to prevent injury and/or overtraining
- 3.B.4 Knowledge of safety rules and procedures for using exercise equipment
- 3.B.5 Knowledge of importance and benefits of planning the exercise session and recording session outcomes
- 3.B.6 Knowledge of signs and symptoms of a heart attack, stroke, and other acute health related issues
- 3.B.7 Knowledge of types of exercise-related injuries such as strains, sprains, bursitis, shin splints, their signs/symptoms, and impact on exercise session
- 3.B.8 Knowledge of contraindicated or “risky” exercises and safer alternatives
- 3.B.9 Knowledge of modified, amplified, or alternative exercises to accommodate different levels of fitness, abilities, and/or to prevent exacerbation of chronic/acute conditions
- 3.B.10 Knowledge of various environmental effects on exercise risk and appropriate safety guidelines
- 3.B.11 Skill in instructing individuals in how to perform activities
- 3.B.12 Skill in determining the kind of tools and equipment needed to effect desired results
- 3.B.13 Skill in recognizing pertinent abilities or physical limitations, and selecting and using appropriate training methods, equipment, and procedures
- 3.B.14 Skill in monitoring and recognizing signs of discomfort/distress during physical activity and responding appropriately
- 3.B.15 Ability to teach and demonstrate use of cardiorespiratory equipment such as treadmills, stationary cycles, elliptical machines
- 3.B.16 Ability to inspect and maintain fitness equipment and physical activity surroundings to ensure safety
- 3.B.17 Ability to monitor and recognize proper and improper exercise technique and apply biomechanical principles to provide corrective measures necessary for proper exercise execution
- 3.B.18 Ability to explain the Rating of Perceived Exertion Scale (Borg Scale) and use to evaluate exercise intensity
- 3.B.19 Ability to monitor exertion levels; and adjust training as necessary in response to underexertion or overexertion to maximize physical activity benefits
- 3.B.20 Ability to teach and demonstrate use of resistance training equipment (weight machines, free weights, small apparatuses, resistance tubing, others) using proper exercise form and technique
- 3.B.21 Ability to teach and demonstrate flexibility exercises
- 3.B.22 Ability to develop and follow established injury and/or emergency procedures including CPR, complete injury report form(s), and refer injured persons to an appropriate healthcare professional
- 3.B.23 Ability to identify and recommend appropriate hydration methods dependent on type and length of physical activity
- 3.B.24 Ability to recognize dehydration symptoms and provide appropriate response(s)
- 3.B.25 Ability to recommend appropriate clothing, shoes, and accessories for physical activity

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C. Program Design: Cardiorespiratory, Strength, Flexibility

- 3.C.1 Knowledge of necessary criteria for an exercise to be considered aerobic
- 3.C.2 Knowledge of exercise principles of overload, specificity, and progression
- 3.C.3 Knowledge of methods to determine target heart rate (heart rate reserve, maximal heart rate, and others)
- 3.C.4 Knowledge of primary, secondary, and non-aerobic activities
- 3.C.5 Knowledge of components of a cardiorespiratory exercise program (mode, frequency, intensity, and duration)
- 3.C.6 Knowledge of definitions of strength, absolute strength, dynamic strength, and power
- 3.C.7 Knowledge of motor-related fitness components and basic techniques to train these components
- 3.C.8 Knowledge of concepts of hypertrophy, motor unit recruitment, and hyperplasia
- 3.C.9 Knowledge of estimating the 1 Repetition Maximum (1RM)
- 3.C.10 Knowledge of and associated interactions between frequency, intensity, repetitions, sets, total volume, range of motion, and tempo
- 3.C.11 Knowledge of resistance training principles and resistance training systems (Super Set, Pyramid Training, etc)
- 3.C.12 Knowledge of core stabilization and appropriate training methods to increase core strength and core endurance
- 3.C.13 Knowledge of periodization of training programs
- 3.C.14 Knowledge of methods of and exercise program guidelines for flexibility training
- 3.C.15 Skill in selection, proper application, and modification/amplification of cardiorespiratory training exercises within abilities and goals
- 3.C.16 Skill in selection, proper application, and modification/amplification of resistance training exercises within abilities and goals
- 3.C.17 Skill in selection, proper application, and modification/amplification of flexibility training exercises within abilities and goals for maintaining or improving range of motion/extensibility
- 3.C.18 Ability to apply current national physical activity Guidelines for achieving health benefits to cardiorespiratory and strength training program design
- 3.C.19 Ability to use an individual's current level of cardiorespiratory fitness to appropriately determine mode, intensity, and/or duration of cardiorespiratory training
- 3.C.20 Ability to determine an individual's target heart rate, including appropriate modifications when required
- 3.C.21 Ability to apply aerobic and anaerobic metabolism principles and enlist specific training methods to improve performance and bring about desired adaptations
- 3.C.22 Ability to incorporate an interval training program, if desired and appropriate, that is based on an individual's current fitness level and ability
- 3.C.23 Ability to provide appropriate cardiorespiratory training program progression
- 3.C.24 Ability to use an individual's current level of strength to appropriately determine mode, frequency, intensity, and progression of resistance training
- 3.C.25 Ability to train to specific goals based on muscle fiber type properties
- 3.C.26 Ability to apply health and fitness status data related to acute and chronic physical and health conditions and appropriately modify mode, frequency, intensity, and/or duration to develop suitable individualized cardiorespiratory and strength training programs to meet goals and/or special requirements
- 3.C.27 Ability to apply appropriate flexibility techniques and methods for desired results

D. Program Evaluation

- 3.D.1 Skill in adjusting program design in response to client actions or new information
- 3.D.2 Skill in gauging exercise intensity and making appropriate program design adjustments
- 3.D.3 Ability to monitor progress toward goals and adapt/adjust program(s) as needed
- 3.D.4 Ability to measure training effects over time

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4. Professional Responsibilities

A. Standards of Practice

- 4.A.1 Knowledge of boundaries that determine scope of practice for personal trainers
- 4.A.2 Knowledge of liability types and issues related to health history review, fitness assessment, and program design/implementation and methods of minimizing liability/risk
- 4.A.3 Knowledge of confidentiality practices
- 4.A.4 Knowledge of current research in physical activity and exercise and their effects on various health conditions/outcomes
- 4.A.5 Knowledge of appropriate referral resources and professionals
- 4.A.6 Ability to discuss the importance of the health-related components of fitness
- 4.A.7 Ability to identify and communicate specific lifestyle changes (i.e., non-pharmacological) that are associated with improvements in various health conditions
- 4.A.8 Ability to provide relevant and reputable information and resources regarding nutrition, weight control, and lifestyle issues
- 4.A.9 Ability to complete requirements to maintain certification (continuing education, CPR, etc.)

B. Leadership Techniques

- 4.B.1 Knowledge of ethics and professional practices
- 4.B.2 Knowledge and use of appropriate clothing, shoes, and accessories for the fitness professional
- 4.B.3 Knowledge of basic communication skills and characteristics necessary for effective teaching/exercise leadership
- 4.B.4 Skill in increasing an individual's self confidence and ability to independently continue appropriate levels of physical activity
- 4.B.5 Skill in conveying information effectively
- 4.B.6 Skill in effective communication regarding potentially sensitive topics
- 4.B.7 Skill in listening and responding to client needs and concerns
- 4.B.8 Ability to maintain appropriate and effective relationships

C. Basic Business Principles

- 4.C.1 Knowledge of key marketing principles
- 4.C.2 Knowledge of the purpose and importance of identifying and meeting the needs of niche and target markets
- 4.C.3 Knowledge of basic financial management principles
- 4.C.4 Knowledge of principles and processes for providing customer and personal services – needs assessment, quality standards for services, and evaluation of customer satisfaction
- 4.C.5 Skill in using time management principles in the planning and execution of activities
- 4.C.6 Ability to price, promote, follow-up, and close sales of personal training services
- 4.C.7 Ability to maintain a systematic process of documenting services for bookkeeping and billing purposes
- 4.C.8 Ability to collect, record, and securely retain information/documentation for appropriate amounts of time