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## EXAM CONTENT OUTLINE



### ATTENTION EXAM CANDIDATES!

When preparing for an ACE® certification exam, be aware that the material presented in this manual, or any other text or educational materials, may become outdated due to the evolving nature of the fitness and healthcare industries, as well as new developments in current and ongoing research. ACE certifications and the exams one must pass to earn these certifications are based on in-depth job analyses and industry-wide validation surveys.

By design, ACE certification exams assess a candidate's ability to analyze multiple case studies that are representative of the work that a certified professional would encounter on a daily, weekly, or monthly basis, and then to apply knowledge of the most current scientifically based professional standards and guidelines to determine the best solution for the scenario presented. *The dynamic nature of this field requires that ACE certification exams be regularly updated to ensure that they reflect the latest industry findings and research. Therefore, the knowledge, skills, and abilities required to pass these exams are not solely represented in this or any other industry text or educational materials.* In addition to learning the material presented on our website, this manual, and associated educational resources, ACE strongly encourages all exam candidates and fitness professionals to keep abreast of new developments, guidelines, and standards from a variety of valid industry sources.

For the most up-to-date version of the Exam Content Outline, please go to [www.ACEfitness.org/fitness-certifications/certification-exam-content.aspx](http://www.ACEfitness.org/fitness-certifications/certification-exam-content.aspx) and download a free PDF.



## EXAM CONTENT OUTLINE

The Exam Content Outline is essentially a blueprint for the exam. As you prepare for the ACE Certified Medical Exercise Specialist (CMES) exam, it is important to remember that all questions map directly to one of the task statements in this outline.

### *Target Audience Statement*

The ACE Certified Medical Exercise Specialist (CMES) is an integral member of the healthcare team, developing and delivering specific and complementary programming in collaboration with other healthcare providers. The CMES has expertise in conducting assessments and designing comprehensive health and fitness programs to help clients prevent and manage disease, avoid injuries, improve overall wellness and function throughout all phases of medical interventions, and return to desired activities following rehabilitation. The CMES applies the principles of exercise science, health coaching, nutrition, psychology, corrective exercise, therapeutic exercise, and pathophysiology to develop individualized health and fitness programs for special-population clients with clinical issues (e.g., cardiovascular, pulmonary, metabolic, and musculoskeletal) in order to facilitate lasting behavior change and improve client health, function, and well-being.

The following eligibility requirements have been established for individuals to sit for the ACE Certified Medical Exercise Specialist examination:

- Must be at least 18 years of age
- Must hold a current adult cardiopulmonary resuscitation (CPR) certificate, and if living in the U.S.A. or Canada, a current automated external defibrillator (AED) certificate
- Must hold a four-year (bachelor's) degree in exercise science or related field
- Must have 500 hours of work experience designing and implementing exercise programs for apparently healthy and/or at-risk individuals, as documented by a qualified professional

## DOMAINS, TASKS, AND KNOWLEDGE AND SKILL STATEMENTS

A Role Delineation Study, or job analysis, was conducted by the American Council on Exercise and Castle Worldwide, Inc., for the ACE Certified Medical Exercise Specialist program. The first step in this process was completed by a panel of subject matter experts in the various disciplines within the field of medical exercise as an advanced specialization within fitness. The primary goal of the panel was to identify the primary tasks performed by Certified Medical Exercise Specialists in helping individuals with a wide variety of special needs (e.g., disease, post-rehabilitation) independently and in cooperation with other qualified healthcare professionals to manage health risks and improve health, fitness, mobility, and quality of life through medical exercise programs.

The panel first identified the major responsibilities performed by a professional Certified Medical Exercise Specialist. These responsibilities are defined as “Tasks,” and it was determined that the responsibilities of the professional CMES could be described in 16 task statements. These tasks were then grouped into four Performance Domains, or major areas of responsibility.

The Performance Domains are listed below, with the percentage indicating the portion of the exam devoted to each Domain:

- Domain I: Interviews and Assessments – 27%
- Domain II: Program Design, Implementation, and Modification – 35%
- Domain III: Communication and Behavior Change – 21%
- Domain IV: Professional Conduct and Risk Management – 17%

Each Performance Domain is composed of Tasks, which detail the job-related functions under that particular Domain. Each Task is further divided into Knowledge and Skill Statements that detail the scope of information and understanding required to perform each Task and explain how the skills required to apply that understanding in a practical setting.

The Domains, Task Statements, and Knowledge and Skill Statements identified by the panel of subject matter experts were presented to a large, nationally representative group of current ACE Certified Medical Exercise Specialists through an online survey, and the survey results were used to validate the work of the panel and establish test specifications for the CMES exam. This completed the Role Delineation Study, with the outcome of this study being the ACE Certified Medical Exercise Specialist Exam Content Outline detailed here. Please note that while each question on the CMES exam maps to one of the Tasks in the Exam Content Outline, not all Knowledge and Skill Statements will be addressed on each exam administration, as there are not enough questions on a certification exam to cover every Knowledge and Skill Statement.

## DOMAIN I: INTERVIEWS AND ASSESSMENTS

**27%**

### **Task 1**

**Gather health, fitness, and lifestyle information from client interviews and journals, electronic medical records, questionnaires, and communication with other healthcare providers to ensure accurate screening and assessment of the client.**

*Knowledge of:*

- a. Industry standard screening and assessment tools
- b. Key elements of health-risk appraisal (e.g., risk factors, nutrition, lifestyle behaviors, medical history, physical activity)
- c. Additional elements of health-risk appraisal (e.g., social support, psychological well-being)
- d. Legal forms (e.g., informed consent, waivers, physician's release, release of information)
- e. Applicable healthcare regulatory standards (e.g., HIPAA)
- f. Interviewing methods
- g. Healthcare networking and communication practices

*Skill in:*

- a. Selecting appropriate forms for specific client situations
- b. Requesting and receiving information from healthcare providers in a timely manner
- c. Effective listening
- d. Effective interviewing
- e. Processing information received from various sources

### **Task 2**

**Evaluate health, fitness, and lifestyle information using industry guidelines and recommendations to assess an individual's readiness for physical activity, facilitate program design, optimize adherence, identify at-risk clients, and make appropriate referrals.**

*Knowledge of:*

- a. Standard guidelines for determining risk factors, signs and symptoms, and risk stratifications
- b. Health and lifestyle conditions/situations requiring medical release, referral, or further investigation
- c. Program readiness factors (physical, mental, emotional, situational, preferential)
- d. Contraindications for program participation

*Skill in:*

- a. Using information collected to facilitate program design
- b. Recognizing the need to gather further information
- c. Identifying disease risk factors, signs, and symptoms
- d. Discerning the need for medical clearance or referral
- e. Identifying client readiness, expectations, and personal preferences

### Task 3

**Perform baseline and periodic follow-up screens and assessments using recommended guidelines and protocols in order to optimize program design, ensure safety, and enhance effectiveness.**

*Knowledge of:*

- a. Screening and assessment methods (e.g., blood pressure, blood glucose, posture, gait, cardiorespiratory, strength, flexibility, functional movement)
- b. Population-specific screenings and assessments
- c. Appropriate timing for screenings, assessments, and reassessments
- d. Exercise protocols, guidelines, and techniques
- e. Established norms/benchmarks for various screenings and assessments
- f. Safe and effective programs
- g. Risk stratification (e.g., ACSM, AACVPR)

*Skill in:*

- a. Selecting appropriate screens and assessments
- b. Performing appropriate screens and assessments
- c. Interpreting screening and assessment results
- d. Applying screening and assessment results to optimize program design
- e. Identifying risk
- f. Referring to appropriate healthcare professionals

## DOMAIN 2: PROGRAM DESIGN, IMPLEMENTATION, AND MODIFICATION

35%

### Task 1

**Set realistic and appropriate goals based on client expectations and limitations, assessment data, and recommendations from healthcare professionals.**

*Knowledge of:*

- a. Goal-setting methods (e.g., SMART)
- b. Goal-setting types (e.g., outcome, process, performance)
- c. Effective communication and collaboration styles
- d. Relationships between goal setting and client expectations/limitations

*Skill in:*

- a. Selecting the appropriate goal-setting method
- b. Helping clients prioritize their wants and needs
- c. Collaborating with clients and healthcare providers
- d. Interpreting and clarifying healthcare provider exercise recommendations/prescriptions
- e. Applying healthcare provider exercise prescriptions appropriately
- f. Creating realistic goals
- g. Helping clients manage expectations

### Task 2

**Design preventive programs for at-risk clients in order to help them improve health, fitness, and function while mitigating the risk of diseases, disorders, ailments, and injuries.**

*Knowledge of:*

- a. Principles of program design (e.g., specificity, overload, rest and recovery, progression, volume, periodization)

- b. Exercise theories and guidelines (e.g., FITT-VP)
- c. Principles of exercise science and nutrition
- d. Risk factors and their application to program design
- e. Pathophysiology (management, treatment, and prevention)
- f. Medications that affect exercise response
- g. Contraindications for exercise (acute and chronic)
- h. Exercise protocols, guidelines, and modalities for specific conditions (e.g., cardiovascular, pulmonary, metabolic, orthopedic, pregnancy, cancer)
- i. Corrective exercise techniques and methods
- j. Dietary recommendations for specific conditions (e.g., cardiovascular, pulmonary, metabolic, pregnancy)
- k. Appropriate regression/progression for special populations

*Skill in:*

- a. Prioritizing program elements
- b. Interpreting medical information to determine appropriate exercise programming and/or contraindications
- c. Designing appropriate client-specific preventive programs
- d. Integrating healthy behaviors into client's activities of daily living

### **Task 3**

**Design programs for clients in all stages of medical intervention in order to complement treatment and improve health, fitness, and function.**

*Knowledge of:*

- a. Principles of program design (e.g., specificity, overload, rest and recovery, progression, volume, periodization)
- b. Exercise theories and guidelines (e.g., FITT-VP)
- c. Principles of exercise science and nutrition
- d. Pathophysiology (management, treatment, and prevention)
- e. Psychological impact of acute and chronic illnesses/injuries
- f. Medications that affect exercise response
- g. Contraindications for exercise (acute and chronic)
- h. Exercise protocols, guidelines, and modalities for specific conditions (e.g., cardiovascular, pulmonary, metabolic, orthopedic, pregnancy, cancer)
- i. Exercise protocols, guidelines, and modalities prior to medical intervention (e.g., bariatric surgery, orthopedic surgery, joint replacements, organ transplants)
- j. Post-treatment exercise protocols, guidelines, and modalities
- k. Corrective exercise techniques and methods
- l. Dietary recommendations for specific conditions (e.g., cardiovascular, pulmonary, metabolic, pregnancy)

*Skill in:*

- a. Prioritizing program elements
- b. Interpreting medical information to determine appropriate exercise programming and/or contraindications
- c. Designing appropriate client-specific programs
- d. Integrating healthy behaviors into clients' activities of daily living

## Task 4

**Modify a client's program and goals based on reassessment data; exercise, nutrition, and lifestyle logs; client- and healthcare provider–reported information in order to ensure program safety and success.**

*Knowledge of:*

- a. Program modifications for exercise, nutrition, and lifestyle
- b. Environmental factors requiring program modification
- c. Health and lifestyle conditions/situations requiring program modification
- d. Exercise progressions and regressions
- e. Exercise guidelines, techniques, and protocols
- f. Nutrition guidelines and recommendations
- g. Behavioral change strategies
- h. Healthy lifestyle practices
- i. Relative and absolute criteria for terminating exercise

*Skill in:*

- a. Interpreting client reassessment data
- b. Communicating reassessment results to client and healthcare providers
- c. Reestablishing goals
- d. Determining appropriate program modifications
- e. Assessing client health-related lifestyle behaviors
- f. Assessing client food intake
- g. Identifying signs and symptoms for terminating exercise
- h. Modifying programs based on self-monitoring data

## Task 5

**Collaborate with other members of the healthcare team in order to deliver complementary programs that promote improved health, fitness, and function.**

*Knowledge of:*

- a. Roles and responsibilities of various healthcare providers
- b. Effective communication styles
- c. Tools used in communication with healthcare providers (e.g., assessment summaries, periodic updates, transfer forms, SOAP notes, medical records)
- d. Cross-referral procedures
- e. Treatment protocols for various diseases/dysfunctions (e.g., hypoglycemia, chest pain, ACL reconstruction, low-back pain)
- f. Standard healthcare terminology
- g. Factors affecting client health and well-being
- h. Relationships between exercise, nutrition, supplements, and medications (prescription and over-the-counter)

*Skill in:*

- a. Providing clarity regarding the role of the exercise specialist in the continuum of care
- b. Maintaining detailed documents for all referrals
- c. Communicating with healthcare team members

## DOMAIN III: COMMUNICATION AND BEHAVIOR CHANGE

21%

### Task 1

**Develop rapport with clients using purposeful questioning and attentive listening to facilitate communication, compliance, and a positive working relationship.**

*Knowledge of:*

- a. Communication styles
- b. Personality types
- c. Psychological factors related to illness and injury
- d. Learning styles
- e. Principles of rapport building
- f. Interviewing styles

*Skill in:*

- a. Identifying a client's personality type and learning style
- b. Interpersonal communication (verbal and nonverbal)
- c. Effective listening
- d. Effective interviewing
- e. Assessing individual differences and responding accordingly

### Task 2

**Educate the client on specific health behaviors and self-monitoring tools in order to enhance program adherence, safety, and success.**

*Knowledge of:*

- a. Self-monitoring tools (e.g., blood glucose monitoring, dyspnea, hydration, rest/recovery, heart rate, RPE, talk test) and their appropriate application
- b. Guidelines for exercise participation based on self-monitoring results
- c. Signs and symptoms for modifying and/or terminating exercise
- d. Healthy behaviors
- e. Personality styles
- f. Learning styles
- g. Behavior-change theories and strategies (e.g., barriers and enhancers, stages of change)
- h. Coaching techniques that enhance program adherence and self-efficacy
- i. Evidence-based educational resources

*Skill in:*

- a. Selecting teaching techniques to align with client learning styles
- b. Interpreting self-monitoring data
- c. Identifying stages of change and personality styles
- d. Determining behavior-modification needs based on stage of change and/or personality
- e. Coaching clients through health-related behavioral change
- f. Teaching clients to modify programs based on self-monitoring data

### Task 3

**Instruct clients on safe and effective exercise techniques using appropriate communication, coaching, and cueing strategies in order to optimize program outcomes and build self-efficacy.**



*Knowledge of:*

- a. Coaching techniques
- b. Cueing and spotting techniques
- c. Exercise theories and guidelines (e.g., FITT-VP)
- d. Proper movement patterns including progressions and regressions
- e. Contraindicated exercises for specific diseases/dysfunctions
- f. Exercise modalities, tools, and safety considerations
- g. Proper exercise techniques and body alignment
- h. Positive reinforcement for correcting exercise technique

*Skill in:*

- a. Recognizing postural deviations, poor technique, inefficient movements, and signs of fatigue
- b. Teaching focus and concentration skills to help the client develop kinesthetic awareness
- c. Teaching the rationale behind specific exercises/movement patterns
- d. Helping a client implement a safe and effective home exercise program
- e. Constructive cueing

**Task 4**

**Apply coaching strategies in order to facilitate lasting healthy behavioral change.**

*Knowledge of:*

- a. Behavior-change theories and strategies (e.g., barriers and enhancers, stages of change)
- b. Factors affecting program adherence and effectiveness
- c. Goal-setting methods (e.g., SMART)
- d. Goal-setting types (e.g., outcome, process, performance)
- e. Support systems and resources
- f. Signs and symptoms of psychological distress
- g. Personality types
- h. Learning styles
- i. Appropriate referral networks

*Skill in:*

- a. Identifying personality types and learning styles
- b. Identifying factors affecting program adherence and effectiveness
- c. Coaching clients through lapses
- d. Educating clients in personal change strategies
- e. Cultivating self-efficacy
- f. Identifying barriers to change
- g. Strategic planning to overcome barriers
- h. Identifying stress triggers
- i. Goal creation and compliance
- j. Creating a positive exercise experience

## **DOMAIN IV: PROFESSIONAL CONDUCT AND RISK MANAGEMENT**

**17%****Task 1**

**Maintain detailed records using policies and procedures that adhere to professional guidelines in order to track progress, make appropriate adjustments, and communicate (as necessary) with other healthcare professionals.**



*Knowledge of:*

- a. Industry standards, methods, and regulations for record keeping
- b. Methods for protecting client confidentiality
- c. SOAP notes
- d. Policies and procedures for revising records
- e. Standard healthcare terminology

*Skill in:*

- a. Recording and revising information in the appropriate format

**Task 2**

**Comply with applicable laws, regulations, ACE Code of Ethics, and industry guidelines in order to protect the interests of all stakeholders and minimize risk.**

*Knowledge of:*

- a. Professional insurance recommendations
- b. ACE Code of Ethics
- c. ACE Professional Practices and Disciplinary Procedures
- d. Facility safety guidelines
- e. Importance of laws and regulations (federal and local)
- f. CMES scope of practice

*Skill in:*

- a. Providing safe and effective exercise instruction/education
- b. Safeguarding confidential information
- c. Referring clients to more qualified fitness, medical, or health professionals when appropriate
- d. Administering CPR, and AED if accessible
- e. Administering basic injury-management procedures
- f. Enhancing healthcare professionals' confidence in the fitness industry
- g. Establishing and maintaining clear professional boundaries

**Task 3**

**Recognize and respond to acute medical conditions and injuries by following an emergency action plan in order to provide appropriate care and comply with risk-management practices.**

*Knowledge of:*

- a. Components of an emergency action plan
- b. First aid: Prevention, care, and treatment
- c. CPR/AED: Prevention, care, and treatment
- d. Emergency supplies (e.g., personal protective equipment, first aid kit, AED, oxygen)
- e. Signs, symptoms, and risks associated with diseases, dysfunctions, and injuries

*Skill in:*

- a. Developing an emergency action plan
- b. Recognizing signs and symptoms of an impending health threat
- c. Administering first aid
- d. Administering CPR
- e. Using an AED
- f. Responding to emergencies and injuries

## Task 4

Pursue information from professional resources in order to provide services consistent with accepted standards of care.

### *Knowledge of:*

- a. Evidence-based educational resources regarding the following topics (not an exhaustive list):
  - o Relationships among exercise, nutrition, supplements, and medications (prescription and over-the-counter)
  - o Relationships between nutrition/hydration and disease prevention and treatment
  - o Relationships between alternative health practices and disease prevention and treatment
  - o Health parameters for certain diseases/dysfunctions
- b. Health and fitness trends
- c. Governing bodies and professional associations that produce guidelines and recommendations for health and fitness (e.g., American Heart Association, American College of Sports Medicine, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services)
- d. Guidelines and recommendations for health and fitness provided by governing bodies and professional associations

### *Skill in:*

- a. Evaluating the credibility of educational resources
- b. Interpreting and applying research findings
- c. Locating appropriate educational resources