

Section 04: Purpose, Basic Principles, and Guidelines for Health-Related Fitness Testing

ACSM Guidelines: Chapter 4 – Health Related Physical Fitness Testing and Interpretation (pp. 60-62); Chapter 3 – Pre-Exercise Evaluations (pp. 53-58)

ACSM Manual: Chapter 1 – Introduction (pp. 4-10), Chapter 2 (pp. 12-15)

HPER 4450

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Outline

- Purpose of health-related fitness testing
- Choosing appropriate tests
- Pre-test instructions
- Order of testing
- Testing conditions (environment)
- Interpreting test scores



Purpose of Testing

- Educate individuals
 - Present health/fitness status
 - Comparison to norms
- Develop/individualize exercise programs
- Evaluate exercise progress
- Motivate individuals to better fitness
 - Use of attainable goals
- Provide data for risk stratification



Choosing Appropriate Tests

- Ease of test administration
- Ease of normative data comparison
 - Criterion-referenced standards
 - Normative standards
- Economy issues
 - Budgeting
 - Staff and training needs
 - Client understanding of procedures and results
- Validity, reliability and accuracy of test results



Pre-Test Instructions

- **General Instructions:**
 - Wear loose-fitting, comfortable clothes
 - Avoid food, alcohol, and caffeine for at least 3 hours before the test.
 - Drink plenty of fluids during the preceding 24 hours until the test.
 - Avoid strenuous exercise on the day of the test.
 - Adequate sleep (6-8 hours) night before.
- **Explanation of Procedures:**
 - Patient/client should be explained the purpose of each test, what it entails, risks, etc.
 - AM (Chapter 2 pp. 12-15), AG (Chapter 53-57)



Order of Testing / Procedures

- **Preliminary procedures:**
 - All forms, documents, data sheets are organized and readily available
 - Ensure that equipment is calibrated
 - Organize equipment so that tests can follow in sequence without taxing the same muscle group repeatedly
 - Provide informed consent forms (ACSM Guidelines Figure 3.1, pp. 56-57)



Order of Testing / Procedures

- **Test Order:**
 - Resting measurements
 - HR, BP
 - Height, weight, body composition
 - Exercise Measurements
 - CR endurance
 - Muscular fitness
 - Flexibility



Testing Conditions (Environment)

- Influences test validity and reliability
- Overlaps with pre-test (General) instructions
- Environmental conditions:
 - Temperature: 68-72°F (20-22°C)
 - Humidity: < 60%



Other Considerations

- **Equipment Calibration:**
 - Pendulum on Monark cycle ergometers
 - Scales
- **Standardization:**
 - Subject and environmental conditions
 - Equipment
 - Testing procedures



Interpreting Test Scores

- **Things to consider:**
 - Are the norms for a test specific to different ages and genders?
 - Do the norms represent the entire population for scores, from low to high?
 - How do you interpret norms that use descriptors such as “excellent, average, poor”?



Interpreting Test Scores

- **Criterion-referenced standards**
 - Desirable scores based on what experts have agreed are relative to the betterment of health
 - Often expressed as adjectives (e.g., excellent, good, poor)
 - Subject to interpretation
- **Normative data**
 - Scores based on past performance of a group of similar individuals
 - Often expressed as a percentile score (e.g., 50th, 90th)
- **Raw scores**
 - No comparison with any set of external standards
 - Comparison only with future or past results for that client on that particular test

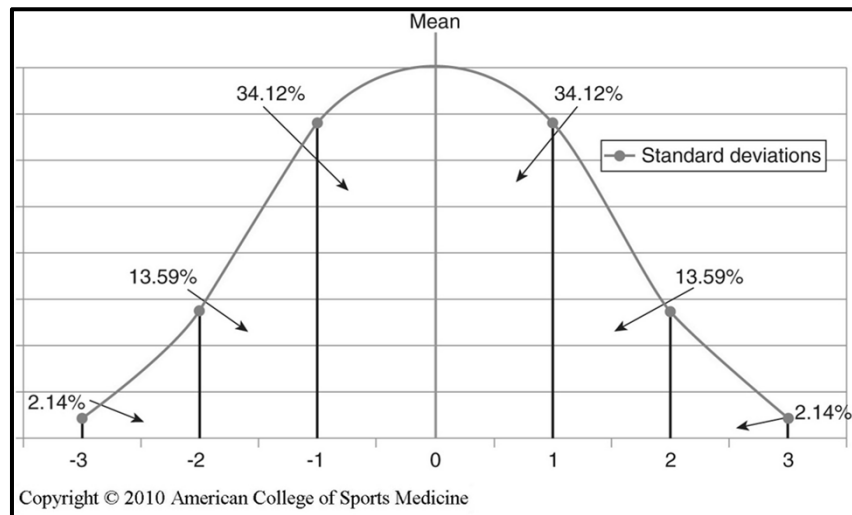


Interpreting Test Scores

- **Standard error of the estimate (SEE)**
 - If fitness level is predicted from measurements made in testing, there will likely be some degree of prediction error
 - Variability is expressed as a standard error of the estimate (SEE)
 - Based on general distribution of scores in the population under a bell-shaped curve
 - Relates to the validity of a particular test item



Interpreting Test Scores



Interpreting Test Scores

- **Standard error of the estimate (SEE) (cont'd)**
 - Examples:
 - Age-predicted maximal HR ($220 - \text{age}$)
 - $\text{SEE} = \pm 12 \text{ bpm}$
 - So, a 22 year old would have a predicted maximal HR of 198 bpm.
 - Taking into account the SEE, what it really means is that 68% of 22 year olds would have a true maximal HR between 186 and 210 bpm.
 - Percent body fat (%BF) via skinfolds
 - $\text{SEE} = 3.8\%$
 - So, if you measure a persons %BF to be 20%, what it really means is that 68% of persons with a %BF of 20% actually fall between 16.2 %BF and 23.8 %BF
 - Or, 32% of persons with a measured 20 %BF will actually be $< 16.2\%$ or $> 23.8\%$



Interpreting Test Scores

- **Correlation coefficient (r)**
 - Mathematical expression of the relationship between items or variables
 - The relationship between a test score item that is predicted versus an actual measurement of the same
 - Relationship may be positive or negative
 - Relates to validity of a test item as well as repeatability (reliability)
 - The closer r is to 1.0, the greater the validity and reliability of the score