

Quiz Policies

Eligibility

The NCSF online quizzes are open to any currently certified fitness professional, 18 years or older.

Deadlines

Course completion deadlines correspond with the NCSF Certified Professionals certification expiration date. Students can obtain their expiration dates by reviewing either their certification diploma or certification ID card.

Cancellation/Refund

All NCSF continued education course studies are non-refundable.

General Quiz Rules

- You may not have your quiz back after sending it in.
- Individuals can only take a specific quiz once for continued education units.
- Impersonation of another candidate will result in disqualification from the program without refund.

Disqualification

If disqualified for any of the above-mentioned reasons you may appeal the decision in writing within two weeks of the disqualification date.

Reporting Policy

You will receive your scores within 4 weeks following the quiz. If you do not receive the results after 4 weeks please contact the NCSF Certifying Agency.

Re-testing Procedure

Students who do not successfully pass an online quiz have the option of re-taking. The fees associated with this procedure total \$15 (U.S) per request. There are no limits as to the number of times a student may re-test.

Special Needs

If special needs are required to take the quiz please contact the NCSF so that appropriate measures can be taken for your consideration.

Quiz Rules

What Do I Mail Back to the NCSF?

Students are required to submit the quiz answer form.

What do I Need to Score on the Quiz?

In order to gain the .5 NCSF continued education units students need to score 80% (8 out of 10) or greater on the CEU quiz.

Where Do I Mail My Quiz Answer Form?

You will mail your completed answer form to:

NCSF

Attn: Dept. of Continuing Education

5915 Ponce de Leon Blvd., Suite 60

Coral Gables, FL 33146

How Many CEUs Will I Gain?

Professionals who successfully complete the any continuing education quiz will gain .5 NCSF CEUs per quiz.

How Much does each quiz cost?

Each quiz costs the student \$15.00.

What Will I Receive When The Course Is Completed?

Students who successfully pass any of the NCSF online quizzes will receive their exam scores, and a confirmation letter.

How Many Times Can I Take The Quizzes For CEUs?

Individuals can take each NCSF quiz once for continuing education credits.

A CLOSER LOOK AT SKINFOLD ASSESSMENT

Skinfold analysis is a common field assessment used by fitness professionals to predict body fatness. The technique is based on the fact that 50-70% of stored fat lies between the skin and muscle, referred to as subcutaneous fat. The measurement technique requires the tester to identify gender specific sites which reflect predetermined assessment locations for regression equations calculated to predict body density. Two of the most popular groups of equations identified by their respective name sake are the Jackson & Pollack, and Durnin & Wormersley multi-site skinfold equations. The equations are based on the measure of skinfold at select sites expressed in millimeters of thickness. The skinfold measurements are entered into the population specific regression equation to predict body density which is expressed as a percentage of fat. According to the literature, use of field method prediction equations developed from 2-component model (Siri equation) reference measures of body composition systematically underestimate relative body fatness based on comparisons to hydrostatic (underwater) weighing. Ethnic differences further invalidate the Siri equation as seen in American Indian women, African-American men and women, and Hispanic women when standard equations are used. Researchers suggest that this is due to the fact the average fat free body (FFB) density of these

ethnic groups exceeds the assumed value (1.1 g/ml). Unfortunately, the overwhelming majority of field method prediction equations have been developed and cross-validated for Caucasian populations and are based on 2-component model reference measures. Because ethnicity may affect the FFB and regional fat distribution, race-specific prediction equations should be used to enhance the accuracy of the assessment.

Literature reviews suggest that these same equations have a tendency to under predict body fatness when applied to multi-compartment comparisons. When compared to hydrodensitometry, the equations demonstrated a greater measurement disparity. According to Aristizábal et al (2007), skinfold thickness equations showed poor validity for body fat assessment as the equations showed significant differences and lower correlation coefficients with hydrodensitometry. The equations “indicated agreement with hydrodensitometry over very wide limits” suggesting a large standard estimation of error for skinfold assessment. When circumference and bone breadth were added to skinfold measures the accuracy improved based on the validity of dual x-ray absorptiometry. Garcia et al. (2005) applied a modified equation method to enhance predictability, thereby reducing the under estimations found from skinfold assessment.

BFM (kg) for men = $-40.750 + \{(0.397 \times \text{waist circumference}) + [6.568 \times (\text{triceps SF} + \text{subscapular SF} + \text{abdominal SF})]\}$

BFM (kg) for women = $-75.231 + \{(0.512 \times \text{hip circumference}) + [8.889 \times (\text{chin SF} + \text{triceps SF} + \text{subscapular SF})] + (1.905 \times \text{knee breadth})\}$.

These equations provide additional data to help enhance the accuracy sometimes compromised by heterogenous storage patterns and bone mass differences. The combination of girth and skinfold complement the limitations of each when used independently. The most difficult aspect of the equations above is probably the use of the chin site. To most professionals it is an uncommon site and can be perceived as rather invasive, but this location was actually used for decades by the National Institute of Health (NIH) in cohort data collection.

Although equations may lead to some prediction error, two of the larger contributing factors to decreased accuracy using skinfold assessment are technician error and client mass. Literature suggests skinfold expertise requires a large number of practice trials before a tester is considered accurate. Assuming body density estimation from skinfold measurements has a prediction validity to within 3% - 4% for 70% of the population, any errors perpetrated by the tester can widen this gap. Additionally, the amount of mass being measured further hinders the accuracy of the assessment. Large amounts of subcutaneous fat cause additional difficulty in pinching the

proper fold. For this reason it is suggested that skinfold be used for those of healthy weight ranges rather than the overweight and obese populations. Larger amounts of fat not only reduce the ability of the tester to be accurate but also heighten the psychological aspect of the assessment. Skinfold is fairly invasive compared to girth measurement and bioelectrical impedance, and therefore should be avoided when dealing with heavier individuals subject to body image factors.

To improve testing accuracy the tester should comply with all standard protocols and use population specific sites and equations. Arguments have been made that assessments include segmental or regional data. This means skinfold for both men and women should include body sites reflective of gynoid and android storage patterns such as the thigh for females and abdominal or subscapular fold for males.

Commonalities of all testing protocols include identifying and marking the sites, pinching the fold using a pronated grip and fully separating the fold from the underlying muscle before securing the skinfold calipers in the middle of the fold just below the thumb and forefinger; and determining the

measure in a matter of seconds before unclipping the calipers and releasing the fold. Once each fold is assessed the tester should record the measurement before moving on to the subsequent fold. A duration of greater than 15 seconds should be used between same-site skinfolds to ensure the compression of the fold is not a factor. A double pinch technique (demonstrated below) can be used to aid in performing the assessment properly. Grasping the fold using a traditional grip just above the marked site along with a coordinated pinch just below the site aids in properly separating the fat from the underlying muscle and ensures a proper

depth of skinfold. Once the fold is secure, the bottom hand is removed and replaced by the caliper, which is placed over the marked site parallel to the ground. It is important to maintain the skinfold thickness by applying consistent pressure via the pinch until the calipers have been placed properly, the value read, and the calipers subsequently removed. Not holding the fold during the measurement invalidates the assessment. Double pinch practice on the triceps fold is usually beneficial in learning the technique. Sites such as the thigh and abdomen or suprailium are often more challenging and require additional practice.



Example of the double pinch technique being used for assessing the abdominal fold site.

1. What percentage of stored fat is estimated to lie between the skin and muscle?
 - a. 10-25%
 - b. 30-50%
 - c. 50-70%
 - d. 75-85%

2. What is the name of body fat that lies just below the surface of the integument?
 - a. subcutaneous fat
 - b. mesenteric fat
 - c. intramuscular triglycerides
 - d. visceral adiposity

3. When performing a skinfold assessment, what is the correct unit of measurement that is used?
 - a. centimeters
 - b. g/dL
 - c. minimeters
 - d. millimeters

4. In comparison to hydrostatic weighing, skinfold measurements tend to overestimate the level of body fatness of individuals.
 - a. true
 - b. false

5. According to the article, which of the following ethnic groups does the Siri equation predict body fat for most accurately?
 - a. American Indian women
 - b. African-American men
 - c. Caucasian
 - d. Hispanic women

6. Which of the following is the most accurate predictor for body fat?
 - a. skinfold measure
 - b. skinfold and girth measure combined
 - c. girth measure
 - d. girth measure and only chin-site measure

7. Which of the following are the largest contributing factors to decreased accuracy during skinfold assessment?
 - a. hydration status and technician error
 - b. technician error and client mass
 - c. client mass and hydration status
 - d. hydration status and electrolyte level

8. For which of the following population segments should skinfold measures be avoided?
 - a. elderly
 - b. athletes
 - c. children
 - d. visually obese

9. How much time should a tester wait between successive same-site skinfold measures?
- a. 5 seconds
 - b. 15 seconds
 - c. 30 seconds
 - d. 1 minute
10. When performing the double-pinch technique for skinfold assessments the top hand is removed and replaced by the caliper for the reading.
- a. True
 - b. False

Quiz Answer Form

FIRST NAME _____ LAST NAME _____ M.I. _____

TITLE _____

ADDRESS _____ APT. _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

COUNTRY _____ POSTAL CODE _____

CERTIFICATION NO. _____ CERTIFICATION EXP. ____/____/____

MEMBERSHIP NO. _____ MEMBERSHIP EXP. ____/____/____

Quiz Name	Member Price	Total
	\$15	



Discover



Visa



Mastercard



Amex



Check/Money Order

Account No. _____

Exp. Date _____

Security Code _____

Signature _____

Date _____

Quiz Answers

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Fill in each blank with the correct choice on the answer sheet. To receive 0.5 CEUs, you must answer 8 of the 10 questions correctly.

Please mail this Quiz answer form along with the proper enclosed payment to:

NCSF
5915 Ponce de Leon Blvd., Suite 60
Coral Gables, FL 33146

Questions? 800-772-NCSF