



Department of Defense

# INSTRUCTION

**NUMBER** 1308.3

November 5, 2002

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ASD(FMP)

**SUBJECT:** DoD Physical Fitness and Body Fat Programs Procedures

References: (a) DoD Instruction 1308.3, "DoD Physical Fitness and Body Fat Programs Procedures," August 30, 1995 (hereby canceled)  
(b) DoD Directive 1308.1, "DoD Physical Fitness and Body Fat Programs," July 20, 1995  
(c) DoD Directive 1010.10, "Defense Health Promotion," March 11, 1986  
(d) DoD 8910.1-M, "DoD Procedures for Management of Information Requirements," June 30, 1998

## 1. REISSUANCE AND PURPOSE

This Instruction:

1.1. Reissues reference (a) to implement policy, assign responsibilities and prescribe procedures governing physical fitness and weight/body fat standards in the Armed Forces.

1.2. Implements references (b) and (c).

1.3. Contributes to the overall force protection and readiness by reducing unintentional injuries due to poor physical fitness.

## 2. APPLICABILITY

This Instruction applies to the Office of the Secretary of Defense, the Military Departments (including the National Guard and the Reserve components and the Coast Guard both when it is operating as a Military Service in the Navy, and when it is operating as a Military Service of the Department of Transportation), the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational

entities within the Department of Defense (hereafter referred to collectively as "the DoD Components").

### 3. DEFINITIONS

Terms used in this Instruction are defined in enclosure 1.

### 4. POLICY

Service members shall maintain physical readiness through appropriate nutrition, health, and fitness habits. Aerobic capacity, muscular strength, muscular endurance, and desirable body fat composition, form the basis for the DoD Physical Fitness and Body Fat Programs.

### 5. RESPONSIBILITIES

5.1. The Assistant Secretary of Defense for Force Management Policy, under the Under Secretary of Defense for Personnel and Readiness, shall:

5.1.1. Monitor the DoD Physical Fitness and Body Fat Programs in the Department of Defense and coordinate it with health promotion and injury prevention programs.

5.1.2. Coordinate biomedical and transitional research findings into policy recommendations for the Military Services' physical fitness and body fat programs.

5.2. The Assistant Secretary of Defense for Health Affairs, under the Under Secretary of Defense for Personnel and Readiness, shall:

5.2.1. Ensure the Military Departments establish, with their Physical Fitness and Body Fat Programs, a health promotion program that at a minimum:

5.2.1.1. Stresses the benefits of appropriate physical activity and nutrition in maintaining and/or enhancing health, physical fitness, safety, and injury prevention.

5.2.1.2. Makes use of unit and/or installation newspapers, Federal Web Sites, the Armed Forces Radio and Television Service, and other media to provide health promotion and fitness education to the Service members.

5.2.2. Assists in the coordination of the Military Services' medical research on physical fitness and body fat.

5.3. The Secretaries of the Military Departments shall establish in their Military Service a Physical Fitness and Body Fat Program and data repository according to this Instruction to complement the health promotion program that the Office of Assistant Secretary of Defense for Health Affairs (ASD(HA)) has issued.

5.4. The Military Services shall:

5.4.1. Develop and maintain physical fitness programs through the testing of personnel, regardless of age, for fitness based upon Service-appropriate standards.

5.4.2. Conduct physical fitness training that:

5.4.2.1. Suits Military Services' needs and missions.

5.4.2.2. Maintains acceptable risk factors to prevent injuries.

5.4.2.3. Applies scientific justification and procedures to assess the risk factors.

5.4.3. Ensure physical fitness programs include a wellness concept and lifestyle enhancement programs to improve general health and fitness.

5.4.4. Encourage all DoD civilian employees to participate in physical fitness. The same media channels used to inform and educate Service members may also be used for DoD civilian employees.

5.4.5. Ensure that all commanders and commissioned and noncommissioned officers support health promotion and injury prevention programs and personally maintain high physical fitness standards and general health.

5.4.6. Conduct remedial training for those who fall below the prescribed standards of physical fitness and/or above the designated level of body fat content.

5.4.7. Establish and maintain a data repository that provides initial or baseline statistics and a tracking mechanism that monitors physical fitness and body fat results as specified in this Instruction. Technology used to manage this program repository will be designed to allow information to be transferred with an individual when on permanent change of station.

5.4.8. Provide a report annually to the Assistant Secretary of Defense (Force Management Policy), not later than March 31, that assesses Service physical fitness, body fat and health promotion programs. This reporting period will be January 1 through December 31. The first report is due March 31, 2005. The first reporting period will be January 1, 2004 through December 31, 2004. The report will contain the following:

5.4.8.1. Narrative descriptions of the current physical fitness, body fat, and health promotions programs.

5.4.8.2. Separation policy for personnel who do not meet physical fitness test and body fat standards.

5.4.8.3. Narrative descriptions of remedial programs used to assist Service members in complying with established physical fitness and body fat standards.

5.4.8.4. As automated medical reporting develops, reports will take advantage of those systems to identify fitness-related injuries.

5.4.9. Report the following statistical data on physical fitness testing and body fat standards by gender, age, rank/grade, and component:

5.4.9.1. Number of personnel tested for physical fitness and body fat.

5.4.9.2. Number of personnel who failed the physical fitness test.

5.4.9.3. Number of personnel in physical fitness remedial training.

5.4.9.4. Number of personnel who failed the body fat standards.

5.4.9.5. Number of personnel placed on the weight control program.

5.4.9.6. Number of personnel successfully completing physical fitness remedial training.

5.4.9.7. Number of personnel successfully completing the weight control program.

5.4.10. Develop reporting requirements in accordance with DoD 8910.1-M (reference (d)).

## 6. PROCEDURES

### 6.1. Physical Fitness

6.1.1. Objectives. The Military Services shall design physical fitness training and related physical activities that enhance fitness and general health/injury prevention to promote combat readiness.

6.1.2. Program Design. The Military Services shall design, implement, supervise, and tailor physical fitness programs to suit the particular needs and mission of

the Department of Defense, and their respective Service, consistent with established scientific principles of physical conditioning.

6.1.2.1. Service members should exercise on a regular basis (e.g., three to five times each week) and to an intensity that provides a training effect. Individuals with injuries and on medical profiles, shall be placed on a medically approved exercise program only after consultation with medical authorities.

6.1.2.2. Pregnant Service members will engage in physical activity to maintain cardiovascular and muscular fitness throughout the pregnancy and postpartum period, in accordance with medical guidance. Exercise regimens will consist of routines that include physical training and nutritional counseling.

6.1.2.3. Military Services shall extend their physical fitness programs to incorporate occupational-specific physical fitness requirements for those career fields where it is deemed necessary to ensure adequate skill, performance, and safety. This extension shall include identifying each specific physical capability needed by the occupational specialties. These additional physical fitness standards development will include a risk assessment for prevention of injuries and will reflect levels of physical abilities necessary to meet the duty demands of the occupation. Once the levels or desired physical capability are identified, physical fitness training and testing should be linked to these capabilities. Emerging training methodologies should be considered when designing the appropriate physical fitness training.

6.1.2.4. Commanders and supervisors of Service members may, given the demands of operational readiness, schedule or authorize military Service members time to participate in physical fitness training during the duty day (e.g., 90 minutes, three to five times weekly). This can be an activity posted on a unit training schedule or time allotted at the discretion of the commander or supervisor.

6.1.2.5. Military Services will develop a screening process to determine those personnel at risk for cardiovascular disease. Individuals at increased risk shall be placed on a medically approved exercise program only after consultation with medical authorities.

6.1.2.6. Military Service's policies and programs will assist in motivating Service members toward the achievement of high fitness standards. The Military Services are encouraged to adopt policies and procedures that:

6.1.2.6.1. Recognize personnel who attain outstanding levels of physical fitness and/or make substantial improvement in the level of fitness.

6.1.2.6.2. Provide information for avoidance of conditioning/training injuries; ensure programs are challenging and have sufficient variety that allow Service members to maintain interest in the programs.

### 6.1.3. Evaluation

6.1.3.1. Military Services shall develop and use physical fitness tests (PFTs) that evaluate aerobic capacity (e.g., timed run, submaximal cycling) and muscular strength and muscular endurance (e.g., push-ups, pull-ups, sit-ups, machine tests). PFTs assess Service-wide baseline generalized fitness levels and are not intended to represent mission or occupationally specific fitness demands.

6.1.3.2. All Service members, regardless of age, will be formally evaluated and tested for record at least annually unless under medical waiver. PFT standards may be adjusted for age and gender.

6.1.3.3. Military Services shall implement the existing requirement to formally test and evaluate personnel in all areas cited in the DoD Directive 1308.1 (reference (b)) and this Instruction: aerobic capacity, muscular strength and muscular endurance. Service members who fall below Service-appropriate fitness standards will receive remedial training.

## 6.2. Body Fat

6.2.1. Objectives. Military Services shall design a body fat program that maintains optimal body weight and, more specifically, optimal body fat content (percentage of body weight that is fat), to promote combat readiness.

6.2.2. Program Design. The Military Services shall design, implement, supervise, and tailor body fat programs to suit the particular needs and mission of the Department of Defense, and their respective Service, consistent with established scientific principles of nutrition, body fat composition, and body fat measurement.

6.2.2.1. Design a body fat program that, at a minimum, meets the standards, set forth in this Instruction.

6.2.2.2. Establish Body Mass Index table, which will not be more stringent than prescribed in enclosure 2.

6.2.2.3. Establish percent body fat standards using the circumference-based method (body fat calculation equations, measurement sites, and measurement techniques) as prescribed in enclosure 3. These body fat equations rely heavily on assessment of abdominal fat, the region of greatest interest to objectives of military fitness and general health standards.

6.2.2.3.1. Circumference-based methods are inextricably linked to the military body fat standards. This method has been carefully evaluated against other methods and for applicability to Service members.

6.2.2.3.2. No alternative method of body fat assessment will be allowed.

6.2.2.4. Ensure that gender-appropriate body fat standards shall not be more stringent than 18 percent for men and 26 percent for women, and shall not be more liberal than 26 percent for men and 36 percent for women, as measured using circumference-based methods described in enclosure 3. Military Departments must request a policy exception from the Assistant Secretary of Defense (Force Management Policy) to deviate from the prescribed standards.

6.2.2.5. Design a body fat program that shall include exercise guidance, dietary information or counseling, and assistance in behavioral modification, as appropriate, to help Service members attain body fat standards.

6.2.2.5.1. Satisfactory progress for Service members in remedial training is either 3 to 8 pounds of weight loss or one percent reduction in body fat composition each month.

6.2.2.5.2. Service members shall only be removed from remedial training program upon meeting Service body fat standards.

### 6.2.3. Evaluation

6.2.3.1. Military Services shall use the Body Mass Index Table (as described in enclosure 2) for height-weight screening.

6.2.3.2. Military Services shall use a validated circumference-based equation to evaluate body fat percentage (as described in enclosure 3).

6.2.3.3. All Service members who exceed the maximum screening weights (described in enclosure 2), regardless of age, shall be formally evaluated for body fat composition at least annually.

6.2.3.4. Service members exceeding Service body fat standards (determined to be overfat) will be placed on Service-directed weight control program. This program shall include exercise guidance, dietary information or counseling, and assistance in behavioral modification, as appropriate, to help Service members attain the requirements of the Service.

6.2.3.5. Service members shall be referred to medical authorities for evaluation upon entry in remedial training. The medical evaluation shall recommend Service member for continued physical training or specify medically limiting circumstances. Failure to show progress in meeting the DoD standards, when there are no medically limiting circumstances, may be cause for comment on efficiency or fitness

reports in accordance with Service regulations. Continued failure shall result in consideration for administrative separation under Service regulations.

6.2.3.6. A pregnant Service member's postpartum weight loss should be consistent with the recommendation of medical authorities and the Military Services' guidelines for satisfactory progress.

6.2.3.7. Service members who fall below the minimum weight standards shown in enclosure 2 shall be referred to medical evaluation when first detected.

## 7. INFORMATION REQUIREMENTS

7.1. The annual assessment by the Military Services of their physical fitness, body fat, and health promotion programs is exempt from licensing in accordance with paragraph C4.4.4. of DoD 8910.1-M (reference (d)).

7.2. The statistical data on physical fitness testing and body fat standards by gender, age, rank/grade, and component are exempt from licensing in accordance with paragraph C4.4.3. of DoD 8910.1-M (reference (d)).

## 8. EFFECTIVE DATE

This Instruction is effective immediately.



**Charles S. Abell**  
**Assistant Secretary of Defense**  
**(Force Management Policy)**

Enclosures - 3

- E1. Definitions
- E2. Body Mass Index table
- E3. Body Fat Assessment Procedures

E1. ENCLOSURE 1

DEFINITIONS

E1.1.1. Aerobic Capacity (Aerobic Fitness or Cardio-Respiratory Endurance). The functional capacity of the heart, lungs, and blood vessels to deliver oxygen to the working muscles, and its utilization by the muscles to oxidize energy sources (carbohydrates and fats) to generate energy over sustained periods of time. Essentially, it is the body's capability to receive and use oxygen, carbohydrates, and fats to produce energy.

E1.1.2. Body Fat. The body is composed of fat and fat-free mass (which includes body water, bone mineral, proteins, glycogen, and other minerals). "Body fat" is expressed as "a percentage of total body weight." Total body fat is composed largely of stored fat and a small amount of "essential" fat that makes up cell membranes, nerve sheaths, and structural fat padding vital structures.

E1.1.3. Body Mass Index. A mathematical expression that describes the normal proportions between weight and height. For example, two individuals of different heights, 5'6" and 6'2", would have comparable "skinny" proportions (i.e., the same low body mass index of 19 (kg/m<sup>2</sup>) at 117 and 148 pounds, or "heavy" proportions (the same high body mass index of 27.5 (kg/m<sup>2</sup>) at 170 and 214 pounds, respectively. Body mass index is calculated as weight (in kilograms) divided by the square of height (in meters); the equation for use with English units is  $BMI=704.5 \times wt/ht^2$  where wt is in lbs and ht in inches.

E1.1.4. Maximal. Maximal oxygen uptake is the maximum amount of oxygen that can be delivered to and utilized in the tissues; this is also referred to as aerobic capacity.

E1.1.5. Military Services. As used herein, refers to the Navy (including the Coast Guard when it is operating as a Military Service in the Department of the Navy), the Army, the Air Force, the Marine Corps, and Reserve components.

E1.1.6. Muscular Endurance. The ability of a skeletal muscle or group of muscles to perform repeated contractions for an extended period of time. It is measured as the number of submaximal contractions performed or submaximal sustained contraction time. Most of the practical "strength" tests (e.g., push-ups and sit-ups) are measures of muscular endurance.

E1.1.7. Muscular Strength. The maximal force that can be exerted in a single voluntary contraction of a skeletal muscle or skeletal muscle group. The simplest measure of strength involves various one-repetition maximum weight-lifting test (the heaviest weight that can be lifted only once). Although tests such as push-ups, pull-ups, and sit-ups measure primarily muscular endurance, there is a physiological continuum

where individuals who can perform only a few repetitions of a test are completing a strength test. Thus, the pull-up, for which many individuals can complete only a few repetitions, is closer to a true strength test than push-ups.

E1.1.8. Overfat. A Service member whose body fat exceeds the Service-prescribed standard as measured using the DoD circumference-based method.

E1.1.9. Overweight. A Service member whose body weight exceeds the maximum limit indicated in the Service height to weight screening table. Members who exceed the weight screen may still comply with fitness and general health standards if they meet body fat standards. Overweight members who meet body fat standards have an above average lean mass, a desirable characteristic for individual military readiness.

E1.1.10. Physical Fitness. The capacity to perform physical exercise, consisting of the components of aerobic capacity, muscular strength, and muscular endurance in conjunction with body fat content within an optimal range.

E1.1.11. Physical Readiness. The overall capacity to perform the physical duty of military Service and combat, consisting of the components of physical fitness, health, and motivation.

E1.1.12. Submaximal. Submaximal tests are used to estimate maximal capacity from responses to less than maximal exercise. In general, submaximal tests can be administered more safely than maximal tests. Most submaximal tests rely on the measurement of heart rate at some fixed, submaximal workload.

E1.1.13. Training Effect. The physiological response to exercise (physical training) when conducted with sufficient regularity, intensity, and duration. The response may include improved efficiency of the cardio-respiratory system and/or increased muscular strength/endurance. An aerobic training effect typically requires exercise training conducted a minimum of three times weekly (preferably on alternate days) for 20 to 30 minutes that raises the Service member's heart rate to a level representing 60 to 90 percent of the medically accepted maximum heart rate for his or her age. A training effect for muscular strength and endurance typically requires repeated bouts of high intensity exercise training of relatively shorter duration.

E2. ENCLOSURE 2

BODY MASS INDEX TABLE

E2.1.1. Most tables follow a physiological relationship of weight-for-height known as body mass index (BMI).

E2.1.2. The Department of Defense's height-weight screening table establishes an upper limit of 27.5 and lower limit of 25. Because inappropriately strict weight standards may impair military readiness, no Service shall set more stringent screening weight than those corresponding to a body mass index of 25.

E2.1.3. Height and Weight Measurements

E2.1.3.1. Height

E2.3.1.1. Measurement will be taken with Service member in any uniform or standard physical training uniform or gym clothing. Shoes will not be worn.

E2.1.3.1.2. Service member will stand on a flat surface with the head held horizontal looking directly forward, with the line of vision horizontal, and the chin parallel to the floor. The body should be straight, but not rigid, similar to the body position when at attention.

E2.1.3.1.3. Measurement will be recorded to the nearest inch.

E2.1.3.1.3.1. If the height fraction is less than 1/2 inch, round down to the nearest inch.

E2.1.3.1.3.2. If the height fraction is 1/2 inch or greater, round up to the nearest inch.

E2.1.3.2. Weight

E2.1.3.2.1. Measurement will be taken with Service member in any uniform or standard physical training uniform or gym clothing. Shoes will not be worn. Any extraneous equipment or outer clothing will be removed when the battle dress uniform (BDU) is worn.

E2.1.3.2.2. The measurement will be made on calibrated scales and recorded to the nearest pound with the following guidelines:

E2.1.3.2.2.1. If the weight fraction is less than 1/2 pound, round down to the nearest pound.

E2.1.3.2.2.2. If the weight fraction is 1/2 pound or greater, round up to the nearest pound.

E2.1.3.2.2.3. Services may subtract 1-3 pounds for clothing worn during official weight checks.

E2.1.4. DoD Recommended Height-Weight Screening Table follows on next page.

Table E2.T1. Table Represents Maximum and Minimum Screening Weights Based on Selected BMI Standards

<i>Represents Maximum Allowable Weights for BMI of 27.5 (regardless of age)</i>																							
Height (inches)	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Weight (pounds)	131	136	141	145	150	155	160	165	170	175	180	186	191	197	202	208	214	220	225	231	237	244	250

<i>Represents Maximum Allowable Weights for BMI of 25.0 (regardless of age)</i>																							
Height (inches)	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Weight (pounds)	119	124	128	132	136	141	145	150	155	159	164	169	174	179	184	189	194	200	205	210	216	221	227

<i>Represents Minimum Weights for BMI of 19.0</i>																							
Height (inches)	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Weight (pounds)	91	94	97	100	104	107	110	114	117	121	125	128	132	136	140	144	148	152	156	160	164	168	173

E3. ENCLOSURE 3

BODY FAT ASSESSMENT PROCEDURES

E3.1.1. All the DoD Components shall measure body fat using only the circumference-based method with one set of measurements (Males: height, neck circumference, and abdominal circumference at the navel. Females: height, neck circumference, waist circumference at the thinnest portion of the abdomen, and hips). This avoids unnecessary confusion and perceptions of unfairness between Services. No substitute methods of assessment are permitted. This method has been carefully evaluated for applicability to Service members and represents the best approach, which can be applied by Service members with minimal error (plus or minus 1 percent). This method is valid because of the emphasis on abdominal circumference, the site of human body fat deposition that is most strongly associated with health risks, and which corresponds to other military goals including appropriate appearance and healthy exercise habits.

E3.1.2. All circumference and height measurements are in inches.

E3.1.2.1. Round calculated results to an integer value, erring on the side of the Service member; decimal values imply a greater than actual precision in body fat estimation.

E3.1.2.2. These equations have been converted into look-up tables and are attached as Tables E3.T1. and E3.T2.

E3.1.3. Examples of suitable body fat calculation equations.

Males.

$\% \text{ body fat} = 86.010 \times \log_{10}(\text{abdomen} - \text{neck}) - 70.041 \times \log_{10}(\text{height}) + 36.76$   
(All circumference and height measurements are in inches.)

Females.

$\% \text{ body fat} = 163.205 \times \log_{10}(\text{waist} + \text{hip} - \text{neck}) - 97.684 \times \log_{10}(\text{height}) - 78.387$   
(All circumference and height measurements are in inches.)

E3.1.4. Circumference measurement techniques:

E3.1.4.1. Discrepancies in body fat estimates have frequently been traced to improper measurement techniques. The most common discrepancies stem from improper handling of the measurement tape, errors in the choice of measurement sites, and improperly calibrated height measurement devices. Military Services will use instruction in this enclosure in their Service regulations.

E3.1.4.1.1. When measuring circumferences, apply the tape so that it makes contact with the skin, conforms to the body surface being measured, and does not compress the underlying soft tissues. In the hip circumference measurement, however, you may need firmer pressure to compress standard physical training uniform or gym clothing. Make all circumference measurements in the horizontal plane (i.e., parallel to the floor).

E3.1.4.1.2. Use a tape measure made of non-stretchable material, preferably fiberglass. Do not use cloth or steel tapes. The tape measure width should be 1/4-3/8". The tape measure should be calibrated (i.e., compared with a yardstick or a metal ruler to ensure validity). This is done by aligning the fiberglass tape measure with the quarter inch markings on the ruler. The markings should match those on the ruler; if not, do not use that tape measure.

E3.1.4.2. Height and weight measurements:

E3.1.4.2.1. The height measurement will be taken with the Service member, in any approved uniform or standard physical training uniform or gym clothing, standing on a flat surface with the head and line of vision held horizontal looking directly forward, and the chin parallel to the floor. Shoes will not be worn. The body should be straight but not rigid, similar to the body position when at attention. The measurement will be recorded to the nearest 1/2".

E3.1.4.2.2. The weight will be measured with the Service member in any approved uniform or standard physical training uniform or gym clothing. Shoes will not be worn. Any extraneous equipment or outer clothing will be removed when the battle dress uniform (BDU) is worn. The measurement shall be made on calibrated scales available in units and recorded to the nearest pound with the following guidelines:

E3.1.4.2.2.1. If the Service member's weight fraction is less than 1/2-pound, round **down** to the nearest pound.

E3.1.4.2.2.2. If the Service member's weight fraction is 1/2-pound or greater, round **up** to the next whole pound.

E3.1.5. Body Fat Measurements:

E3.1.5.1. Take all circumference measurements three times and record them to the nearest 1/2 inch. If any of the three measurements differs by more than **one inch** from the other two, take an additional measurement and compute a mathematical average of the three closest measurements to the nearest 1/2 inch and record this value.

E3.1.5.2. Each set of measurements will be completed sequentially to discourage assumption of repeated measurement readings. For males, complete 1 set of abdomen and neck measurements, **not** , for example, three abdomen circumferences

followed by three neck circumferences. Continue the process by measuring the abdomen and neck in series until you have three sets of measurements. For females, complete one set of waist, hip, and neck, measurements, **not**, for example, three waist measurements followed by 3 hip measurements. Continue the process by measuring the waist, hip, neck series until you have 3 sets of measurements.

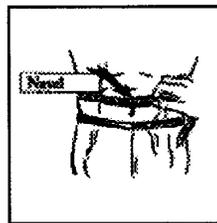
E3.1.5.3. Determine percent body fat for males by subtracting the neck from the abdominal measurement and comparing this value against the height measurement from Table E3.T1.

E3.1.5.4. Determine percent body fat for females by adding the waist and the hip measurements, subtracting the neck measurement, and comparing this value against the height measurement from Table E3.T2.

E3.1.6. Circumference sites and landmarks for males:

E3.1.6.1. Abdomen. Measure abdominal circumference against the skin at the navel (belly button), level and parallel to the floor. Arms are at the sides. Record the measurement at the end of member's normal, relaxed exhalation. Round abdominal measurement down to the nearest 1/2 inch and record in accordance with subparagraph E3.1.5.1. (e.g., round 34 3/4 to 34 1/2).

Abdomen Measurement



E3.1.6.2. Neck. Measure the neck circumference at a point just below the larynx (Adam's Apple) and perpendicular to the long axis of the neck. Do not place the tape measure over the Adam's Apple. Service member should look straight ahead during measurement, with shoulders down (not hunched). The tape will be as close to horizontal as anatomically feasible (the tape line in the front of the neck should be at the same height as the tape line in the back of the neck). Care should be taken so as not to involve the shoulder/neck muscles (trapezius) in the measurement. Round neck measurement up to the nearest 1/2 inch and record in accordance with subparagraph E3.1.5.1. (e.g., round 16 1/4 inches to 16 1/2 inches).

Male Neck Measurement



E3.1.7. Circumference sites and landmarks for females:

E3.1.7.1. Neck. Measure neck circumference at a point just below the larynx (Adam's Apple) and perpendicular to the long axis of the neck. The Service member should look straight ahead during measurement, with shoulders down (not hunched). Round the neck measurement up to nearest 1/2 inch and record in accordance with subparagraph E3.1.5.1. (e.g., round 13 3/8 inches to 13 1/2 inches).

Female Neck Measurement



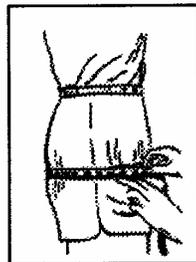
E3.1.7.2. Waist. Measure the natural waist circumference, against the skin, at the point of minimal abdominal circumference, usually located about halfway between the navel and the lower end of the sternum (breast bone). When you cannot easily see this site, take several measurements at probable sites and use the smallest value. Be sure that the tape is level and parallel to the floor. The Service member's arms must be at the sides. Take measurements at the end of member's normal relaxed exhalation. Round the natural waist measurement down to the nearest 1/2 inch and record in accordance with subparagraph E3.1.5.1. (e.g., round 28 5/8 inches to 28 1/2 inches).

Waist Measurement



E3.1.7.3. Hip. Measure the hip circumference while facing the Service member's right side by placing the tape around the hips so that it passes over the greatest protrusion of the gluteal muscles (buttocks) as viewed from the side. Make sure the tape is level and parallel to the floor. Apply sufficient tension on the tape to minimize the effect of clothing. Round the hip measurement down to the nearest 1/2 inch and record in accordance with paragraph subparagraph E3.1.5.1. (e.g., round 44 3/8 inches to 44 inches).

Hip Measurement



E3.1.7.4. Body Fat Estimations. The following calculation tables are derived from the body fat equations originating from the research and statistical analysis performed by:

E3.1.7.4.1. Hodgdon, J.A. and M.B. Beckett (1984) Prediction of percent body fat for U.S. Navy men from body circumferences and height. Report no. 84-11, Naval Health Research Center, San Diego, CA;

E3.1.7.4.2. Hodgdon, J.A. and M.B. Beckett (1984) Prediction of percent body fat for U.S. Navy women from body circumferences and height. Report no. 84-29, Naval Health Research Center, San Diego, CA.

Table E3.T1. Percent Fat Estimation For Men

Circumference Value*	Height (in)									
	60.0	60.5	61.0	61.5	62.0	62.5	63.0	63.5	64.0	64.5
13.5	9	9								
14.0	11	11	10	10	10	10	9	9		
14.5	12	12	12	11	11	11	11	10	10	10
15.0	13	13	13	13	12	12	12	12	11	11
15.5	15	14	14	14	14	13	13	13	13	12
16.0	16	16	15	15	15	15	14	14	14	14
16.5	17	17	16	16	16	16	15	15	15	15
17.0	18	18	18	17	17	17	17	16	16	16
17.5	19	19	19	18	18	18	18	17	17	17
18.0	20	20	20	19	19	19	19	18	18	18
18.5	21	21	21	20	20	20	20	19	19	19
19.0	22	22	22	21	21	21	21	20	20	20
19.5	23	23	23	22	22	22	22	21	21	21
20.0	24	24	24	23	23	23	23	22	22	22
20.5	25	25	25	24	24	24	24	23	23	23
21.0	26	26	25	25	25	25	24	24	24	24
21.5	27	27	26	26	26	26	25	25	25	25
22.0	28	27	27	27	27	26	26	26	26	25
22.5	29	28	28	28	28	27	27	27	27	26
23.0	29	29	29	29	28	28	28	28	27	27
23.5	30	30	30	29	29	29	29	28	28	28
24.0	31	31	30	30	30	30	29	29	29	29
24.5	32	31	31	31	31	30	30	30	30	29
25.0	32	32	32	32	31	31	31	31	30	30
25.5	33	33	33	32	32	32	32	31	31	31
26.0	34	34	33	33	33	33	32	32	32	32
26.5	35	34	34	34	34	33	33	33	33	32
27.0	35	35	35	35	34	34	34	34	33	33
27.5	36	36	36	35	35	35	35	34	34	34

Table E3.T1. Percent Fat Estimation For Men, continued

Circumference Value*	Height (in)									
	60.0	60.5	61.0	61.5	62.0	62.5	63.0	63.5	64.0	64.5
28.0	37	36	36	36	36	35	35	35	35	34
28.5			37	37	36	36	36	36	35	35
29.0					37	37	37	36	36	36
29.5								37	37	36
30.0										
30.5										
31.0										
31.5										
32.0										
32.5										
33.0										
33.5										
34.0										
34.5										
35.0										

Table E3.T1. Percent Fat Estimation For Men, continued

Circumference Value*	Height (in)									
	65.0	65.5	66.0	66.5	67.0	67.5	68.0	68.5	69.0	69.5
13.5										
14.0										
14.5	10	9	9							
15.0	11	11	10	10	10	10	10	9	9	
15.5	12	12	12	11	11	11	11	11	10	10
16.0	13	13	13	13	12	12	12	12	12	11
16.5	14	14	14	14	14	13	13	13	13	12
17.0	16	15	15	15	15	14	14	14	14	14
17.5	17	16	16	16	16	16	15	15	15	15
18.0	18	18	17	17	17	17	16	16	16	16
18.5	19	19	18	18	18	18	17	17	17	17
19.0	20	20	19	19	19	19	18	18	18	18
19.5	21	21	20	20	20	20	19	19	19	19
20.0	22	21	21	21	21	21	20	20	20	20
20.5	23	22	22	22	22	21	21	21	21	21
21.0	24	23	23	23	23	22	22	22	22	21
21.5	24	24	24	24	23	23	23	23	23	22
22.0	25	25	25	25	24	24	24	24	23	23
22.5	26	26	26	25	25	25	25	24	24	24
23.0	27	27	26	26	26	26	26	25	25	25
23.5	28	27	27	27	27	27	26	26	26	26
24.0	28	28	28	28	28	27	27	27	27	26
24.5	29	29	29	29	28	28	28	28	27	27
25.0	30	30	30	29	29	29	29	28	28	28
25.5	31	31	30	30	30	30	29	29	29	29
26.0	31	31	31	31	31	30	30	30	30	29
26.5	32	32	32	32	31	31	31	31	30	30
27.0	33	33	32	32	32	32	32	31	31	31
27.5	34	33	33	33	33	32	32	32	32	32

Table E3.T1. Percent Fat Estimation For Men, continued

Circumference Value*	Height (in)									
	65.0	65.5	66.0	66.5	67.0	67.5	68.0	68.5	69.0	69.5
28.0	34	34	34	34	33	33	33	33	32	32
28.5	35	35	34	34	34	34	34	33	33	33
29.0	36	35	35	35	35	34	34	34	34	34
29.5	36	36	36	36	35	35	35	35	34	34
30.0	37	37	36	36	36	36	35	35	35	35
30.5			37	37	37	36	36	36	36	35
31.0						37	37	36	36	36
31.5									37	37
32.0										
32.5										
33.0										
33.5										
34.0										
34.5										
35.0										

Table E3.T1. Percent Fat Estimation For Men, continued

Circumference Value*	Height (in)									
	70.0	70.5	71.0	71.5	72.0	72.5	73.0	73.5	74.0	74.5
13.5										
14.0										
14.5										
15.0										
15.5	10	10	9	9	9					
16.0	11	11	11	10	10	10	10	10	9	9
16.5	12	12	12	12	11	11	11	11	11	10
17.0	13	13	13	13	13	12	12	12	12	11
17.5	14	14	14	14	14	13	13	13	13	13
18.0	15	15	15	15	15	14	14	14	14	14
18.5	17	16	16	16	16	15	15	15	15	15
19.0	18	17	17	17	17	16	16	16	16	16
19.5	18	18	18	18	18	17	17	17	17	17
20.0	19	19	19	19	19	18	18	18	18	18
20.5	20	20	20	20	19	19	19	19	19	18
21.0	21	21	21	21	20	20	20	20	20	19
21.5	22	22	22	21	21	21	21	21	20	20
22.0	23	23	23	22	22	22	22	22	21	21
22.5	24	24	23	23	23	23	23	22	22	22
23.0	25	24	24	24	24	24	23	23	23	23
23.5	25	25	25	25	25	24	24	24	24	24
24.0	26	26	26	26	25	25	25	25	25	24
24.5	27	27	27	26	26	26	26	26	25	25
25.0	28	28	27	27	27	27	26	26	26	26
25.5	29	28	28	28	28	27	27	27	27	27
26.0	29	29	29	29	28	28	28	28	28	27
26.5	30	30	30	29	29	29	29	28	28	28
27.0	31	30	30	30	30	30	29	29	29	29
27.5	31	31	31	31	30	30	30	30	30	29

Table E3.T1. Percent Fat Estimation For Men, continued

Circumference Value*	Height (in)									
	70.0	70.5	71.0	71.5	72.0	72.5	73.0	73.5	74.0	74.5
28.0	32	32	32	31	31	31	31	31	30	30
28.5	33	32	32	32	32	32	31	31	31	31
29.0	33	33	33	33	32	32	32	32	32	31
29.5	34	34	34	33	33	33	33	32	32	32
30.0	35	34	34	34	34	34	33	33	33	33
30.5	35	35	35	35	34	34	34	34	34	33
31.0	36	36	35	35	35	35	35	34	34	34
31.5	36	36	36	36	36	35	35	35	35	35
32.0	37	37	37	36	36	36	36	36	35	35
32.5				37	37	36	36	36	36	36
33.0							37	37	36	36
33.5										37
34.0										
34.5										
35.0										

Table E3.T1. Percent Fat Estimation For Men, continued

Circumference Value*	Height (in)									
	75.0	75.5	76.0	76.5	77.0	77.5	78.0	78.5	79.0	79.5
13.5										
14.0										
14.5										
15.0										
15.5										
16.0										
16.5	10	10	10	10	9	9				
17.0	11	11	11	11	10	10	10	10	10	9
17.5	12	12	12	12	12	11	11	11	11	11
18.0	13	13	13	13	13	12	12	12	12	12
18.5	14	14	14	14	14	13	13	13	13	13
19.0	15	15	15	15	15	14	14	14	14	14
19.5	16	16	16	16	16	15	15	15	15	15
20.0	17	17	17	17	17	16	16	16	16	16
20.5	18	18	18	18	17	17	17	17	17	16
21.0	19	19	19	19	18	18	18	18	18	17
21.5	20	20	20	19	19	19	19	19	18	18
22.0	21	21	20	20	20	20	20	20	19	19
22.5	22	22	21	21	21	21	21	20	20	20
23.0	23	22	22	22	22	22	21	21	21	21
23.5	23	23	23	23	23	22	22	22	22	22
24.0	24	24	24	24	23	23	23	23	23	22
24.5	25	25	25	24	24	24	24	24	23	23
25.0	26	25	25	25	25	25	24	24	24	24
25.5	26	26	26	26	26	25	25	25	25	25
26.0	27	27	27	27	26	26	26	26	26	25
26.5	28	28	27	27	27	27	27	26	26	26
27.0	29	28	28	28	28	28	27	27	27	27
27.5	29	29	29	29	28	28	28	28	28	27

Table E3.T1. Percent Fat Estimation For Men, continued

Circumference Value*	Height (in)									
	75.0	75.5	76.0	76.5	77.0	77.5	78.0	78.5	79.0	79.5
28.0	30	30	29	29	29	29	29	29	28	28
28.5	31	30	30	30	30	30	29	29	29	29
29.0	31	31	31	31	30	30	30	30	30	29
29.5	32	32	31	31	31	31	31	30	30	30
30.0	32	32	32	32	32	31	31	31	31	31
30.5	33	33	33	32	32	32	32	32	32	31
31.0	34	33	33	33	33	33	33	32	32	32
31.5	34	34	34	34	33	33	33	33	33	33
32.0	35	35	34	34	34	34	34	33	33	33
32.5	35	35	35	35	35	34	34	34	34	34
33.0	36	36	36	35	35	35	35	35	34	34
33.5	37	36	36	36	36	36	35	35	35	35
34.0		37	37	37	36	36	36	36	36	35
34.5					37	37	37	36	36	36
35.0								37	37	36

\* Circumference Value = abdomen circumference – neck circumference (in inches)

Table E3.T2. Percent Fat Estimation For Women

Circumference Value*	Height (in)									
	58.0	58.5	59.0	59.5	60.0	60.5	61.0	61.5	62.0	62.5
45.0	19									
45.5	20	20	19							
46.0	21	20	20	20	19					
46.5	21	21	21	20	20	20	19	19		
47.0	22	22	22	21	21	20	20	20	19	19
47.5	23	23	22	22	22	21	21	21	20	20
48.0	24	23	23	23	22	22	22	21	21	21
48.5	24	24	24	23	23	23	22	22	22	21
49.0	25	25	24	24	24	23	23	23	22	22
49.5	26	26	25	25	24	24	24	23	23	23
50.0	27	26	26	26	25	25	24	24	24	23
50.5	27	27	27	26	26	26	25	25	25	24
51.0	28	28	27	27	27	26	26	26	25	25
51.5	29	28	28	28	27	27	27	26	26	26
52.0	29	29	29	28	28	28	27	27	27	26
52.5	30	30	29	29	29	28	28	28	27	27
53.0	31	30	30	30	29	29	29	28	28	28
53.5	31	31	31	30	30	30	29	29	29	28
54.0	32	32	31	31	31	30	30	30	29	29
54.5	33	32	32	32	31	31	31	30	30	30
55.0	33	33	33	32	32	32	31	31	31	30
55.5	34	34	33	33	33	32	32	32	31	31
56.0	35	34	34	34	33	33	33	32	32	31
56.5	35	35	35	34	34	34	33	33	32	32
57.0	36	36	35	35	34	34	34	33	33	33
57.5	37	36	36	35	35	35	34	34	34	33
58.0	37	37	36	36	36	35	35	35	34	34
58.5	38	37	37	37	36	36	36	35	35	35
59.0	38	38	38	37	37	37	36	36	36	35
59.5	39	39	38	38	38	37	37	36	36	36
60.0	40	39	39	38	38	38	37	37	37	36
60.5	40	40	39	39	39	38	38	38	37	37

Table E3.T2. Percent Fat Estimation For Women

Circumference Value*	Height (in)									
	58.0	58.5	59.0	59.5	60.0	60.5	61.0	61.5	62.0	62.5
61.0	41	40	40	40	39	39	39	38	38	38
61.5	41	41	41	40	40	40	39	39	38	38
62.0	42	42	41	41	40	40	40	39	39	39

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	58.0	58.5	59.0	59.5	60.0	60.5	61.0	61.5	62.0	62.5
62.5	42	42	42	41	41	41	40	40	40	39
63.0	43	43	42	42	42	41	41	41	40	40
63.5	44	43	43	42	42	42	41	41	41	40
64.0	44	44	43	43	43	42	42	42	41	41
64.5	45	44	44	44	43	43	43	42	42	42
65.0	45	45	45	44	44	43	43	43	42	42
65.5	46	45	45	45	44	44	44	43	43	43
66.0	46	46	46	45	45	45	44	44	43	43
66.5	47	46	46	46	45	45	45	44	44	44
67.0			47	46	46	46	45	45	45	44
67.5				47	46	46	46	45	45	45
68.0					47	47	46	46	46	45
68.5							47	46	46	46
69.0								47	47	46
69.5										47
70.0										
70.5										
71.0										
71.5										
72.0										
72.5										
73.0										
73.5										
74.0										
74.5										
75.0										
75.5										
76.0										
76.5										
77.0										
77.5										
78.0										

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	58.0	58.5	59.0	59.5	60.0	60.5	61.0	61.5	62.0	62.5
8.5										
79.0										
79.5										

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	63.0	63.5	64.0	64.5	65.0	65.5	66.0	66.5	67.0	67.5
45.0										
45.5										
46.0										
46.5										
47.0										
47.5	19	19								
48.0	20	20	20	19						
48.5	21	21	20	20	20	19				
49.0	22	21	21	21	20	20	20	19	19	
49.5	22	22	22	21	21	21	20	20	20	19
50.0	23	23	22	22	22	21	21	21	21	20
50.5	24	23	23	23	23	22	22	22	21	21
51.0	25	24	24	24	23	23	23	22	22	22
51.5	25	25	25	24	24	24	23	23	23	22
52.0	26	26	25	25	25	24	24	24	23	23
52.5	27	26	26	26	25	25	25	24	24	24
53.0	27	27	27	26	26	26	25	25	25	24
53.5	28	28	27	27	27	26	26	26	25	25
54.0	29	28	28	28	27	27	27	26	26	26
54.5	29	29	29	28	28	28	27	27	27	26
55.0	30	30	29	29	29	28	28	28	27	27
55.5	31	30	30	30	29	29	29	28	28	28
56.0	31	31	30	30	30	30	29	29	29	28
56.5	32	31	31	31	30	30	30	29	29	29
57.0	32	32	32	31	31	31	30	30	30	29
57.5	33	33	32	32	32	31	31	31	30	30
58.0	34	33	33	33	32	32	32	31	31	31
58.5	34	34	34	33	33	33	32	32	32	31
59.0	35	35	34	34	34	33	33	33	32	32
59.5	35	35	35	34	34	34	33	33	33	33
60.0	36	36	35	35	35	34	34	34	33	33
60.5	37	36	36	36	35	35	35	34	34	34

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	63.0	63.5	64.0	64.5	65.0	65.5	66.0	66.5	67.0	67.5
61.0	37	37	37	36	36	36	35	35	35	34
61.5	38	37	37	37	36	36	36	36	35	35
62.0	38	38	38	37	37	37	36	36	36	35

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	63.0	63.5	64.0	64.5	65.0	65.5	66.0	66.5	67.0	67.5
62.5	39	39	38	38	38	37	37	37	36	36
63.0	40	39	39	39	38	38	38	37	37	37
63.5	40	40	39	39	39	38	38	38	37	37
64.0	41	40	40	40	39	39	39	38	38	38
64.5	41	41	41	40	40	40	39	39	39	38
65.0	42	41	41	41	40	40	40	39	39	39
65.5	42	42	42	41	41	41	40	40	40	39
66.0	43	42	42	42	41	41	41	41	40	40
66.5	43	43	43	42	42	42	41	41	41	40
67.0	44	44	43	43	43	42	42	42	41	41
67.5	44	44	44	43	43	43	42	42	42	41
68.0	45	45	44	44	44	43	43	43	42	42
68.5	45	45	45	44	44	44	43	43	43	43
69.0	46	46	45	45	45	44	44	44	43	43
69.5	46	46	46	45	45	45	44	44	44	44
70.0	47	47	46	46	46	45	45	45	44	44
70.5			47	46	46	46	46	45	45	45
71.0				47	47	46	46	46	45	45
71.5						47	47	46	46	46
72.0							47	47	46	46
72.5									47	47
73.0										
73.5										
74.0										
74.5										
75.0										
75.5										
76.0										
76.5										
77.0										
77.5										

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	63.0	63.5	64.0	64.5	65.0	65.5	66.0	66.5	67.0	67.5
78.0										
78.5										
79.0										
79.5										

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	68.0	68.5	69.0	69.5	70.0	70.5	71.0	71.5	72.0	72.5
45.0										
45.5										
46.0										
46.5										
47.0										
47.5										
48.0										
48.5										
49.0										
49.5	19									
50.0	20	20	19							
50.5	21	20	20	20	19	19				
51.0	21	21	21	20	20	20	19	19		
51.5	22	22	21	21	21	20	20	20	20	19
52.0	23	22	22	22	21	21	21	21	20	20
52.5	23	23	23	22	22	22	22	21	21	21
53.0	24	24	23	23	23	22	22	22	22	21
53.5	25	24	24	24	23	23	23	23	22	22
54.0	25	25	25	24	24	24	24	23	23	23
54.5	26	26	25	25	25	24	24	24	24	23
55.0	27	26	26	26	25	25	25	25	24	24
55.5	27	27	27	26	26	26	25	25	25	25
56.0	28	28	27	27	27	26	26	26	25	25
56.5	29	28	28	28	27	27	27	26	26	26
57.0	29	29	29	28	28	28	27	27	27	26
57.5	30	29	29	29	29	28	28	28	27	27
58.0	30	30	30	29	29	29	29	28	28	28
58.5	31	31	30	30	30	29	29	29	29	28
59.0	32	31	31	31	30	30	30	29	29	29
59.5	32	32	32	31	31	31	30	30	30	29
60.0	33	32	32	32	32	31	31	31	30	30
60.5	33	33	33	32	32	32	32	31	31	31

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	63.0	63.5	64.0	64.5	65.0	65.5	66.0	66.5	67.0	67.5
61.0	34	34	33	33	33	32	32	32	32	31
61.5	35	34	34	34	33	33	33	32	32	32
62.0	35	35	35	34	34	34	33	33	33	32

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	68.0	68.5	69.0	69.5	70.0	70.5	71.0	71.5	72.0	72.5
62.5	36	35	35	35	34	34	34	34	33	33
63.0	36	36	36	35	35	35	34	34	34	34
63.5	37	37	36	36	36	35	35	35	34	34
64.0	37	37	37	36	36	36	36	35	35	35
64.5	38	38	37	37	37	36	36	36	36	35
65.0	38	38	38	38	37	37	37	36	36	36
65.5	39	39	38	38	38	37	37	37	37	36
66.0	40	39	39	39	38	38	38	37	37	37
66.5	40	40	39	39	39	39	38	38	38	37
67.0	41	40	40	40	39	39	39	39	38	38
67.5	41	41	41	40	40	40	39	39	39	38
68.0	42	41	41	41	40	40	40	40	39	39
68.5	42	42	42	41	41	41	40	40	40	39
69.0	43	42	42	42	41	41	41	41	40	40
69.5	43	43	43	42	42	42	41	41	41	41
70.0	44	43	43	43	43	42	42	42	41	41
70.5	44	44	44	43	43	43	42	42	42	42
71.0	45	44	44	44	44	43	43	43	42	42
71.5	45	45	45	44	44	44	43	43	43	43
72.0	46	45	45	45	45	44	44	44	43	43
72.5	46	46	46	45	45	45	44	44	44	44
73.0	47	46	46	46	45	45	45	45	44	44
73.5		47	47	46	46	46	45	45	45	44
74.0				47	46	46	46	46	45	45
74.5					47	47	46	46	46	45
75.0							47	46	46	46
75.5								47	47	46
76.0										47
76.5										
77.0										
77.5										

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	68.0	68.5	69.0	69.5	70.0	70.5	71.0	71.5	72.0	72.5
78.0										
78.5										
79.0										
79.5										

Table E3.T2. Percent Fat Estimation For Women, continue

Circumference Value*	Height (in)									
	73.0	73.5	74.0	74.5	75.0	75.5	76.0	76.5	77.0	77.5
45.0										
45.5										
46.0										
46.5										
47.0										
47.5										
48.0										
48.5										
49.0										
49.5										
50.0										
50.5										
51.0										
51.5										
52.0	20	19	19							
52.5	20	20	20	19	19					
53.0	21	21	20	20	20	20	19	19		
53.5	22	21	21	21	21	20	20	20	19	19
54.0	22	22	22	21	21	21	21	20	20	20
54.5	23	23	22	22	22	22	21	21	21	20
55.0	24	23	23	23	22	22	22	22	21	21
55.5	24	24	24	23	23	23	23	22	22	22
56.0	25	25	24	24	24	23	23	23	23	22
56.5	26	25	25	25	24	24	24	24	23	23
57.0	26	26	26	25	25	25	24	24	24	24
57.5	27	26	26	26	26	25	25	25	25	24
58.0	27	27	27	27	26	26	26	25	25	25
58.5	28	28	27	27	27	27	26	26	26	25
59.0	29	28	28	28	27	27	27	27	26	26
59.5	29	29	29	28	28	28	27	27	27	27
60.0	30	30	29	29	29	28	28	28	28	27

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	73.0	73.5	74.0	74.5	75.0	75.5	76.0	76.5	77.0	77.5
60.5	30	30	30	30	29	29	29	28	28	28
61.0	31	31	30	30	30	30	29	29	29	28
61.5	32	31	31	31	30	30	30	30	29	29
62.0	32	32	32	31	31	31	30	30	30	30

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	73.0	73.5	74.0	74.5	75.0	75.5	76.0	76.5	77.0	77.5
62.5	33	32	32	32	32	31	31	31	30	30
63.0	33	33	33	32	32	32	32	31	31	31
63.5	34	34	33	33	33	32	32	32	32	31
64.0	34	34	34	34	33	33	33	32	32	32
64.5	35	35	34	34	34	33	33	33	33	32
65.0	35	35	35	35	34	34	34	33	33	33
65.5	36	36	35	35	35	35	34	34	34	33
66.0	37	36	36	36	35	35	35	35	34	34
66.5	37	37	37	36	36	36	35	35	35	35
67.0	38	37	37	37	36	36	36	36	35	35
67.5	38	38	38	37	37	37	36	36	36	36
68.0	39	38	38	38	38	37	37	37	36	36
68.5	39	39	39	38	38	38	37	37	37	37
69.0	40	39	39	39	39	38	38	38	37	37
69.5	40	40	40	39	39	39	39	38	38	38
70.0	41	40	40	40	40	39	39	39	38	38
70.5	41	41	41	40	40	40	40	39	39	39
71.0	42	41	41	41	41	40	40	40	39	39
71.5	42	42	42	41	41	41	41	40	40	40
72.0	43	42	42	42	42	41	41	41	40	40
72.5	43	43	43	42	42	42	42	41	41	41
73.0	44	43	43	43	43	42	42	42	41	41
73.5	44	44	44	43	43	43	42	42	42	42
74.0	45	44	44	44	44	43	43	43	42	42
74.5	45	45	45	44	44	44	43	43	43	43

Table E3.T2. Percent Fat Estimation For Women, continued

Circumference Value*	Height (in)									
	73.0	73.5	74.0	74.5	75.0	75.5	76.0	76.5	77.0	77.5
75.0	46	45	45	45	44	44	44	44	43	43
75.5	46	46	46	45	45	45	44	44	44	44
76.0	47	46	46	46	45	45	45	45	44	44
76.5		47	46	46	46	46	45	45	45	44
77.0			47	47	46	46	46	45	45	45
77.5					47	47	46	46	46	45
78.0						47	47	46	46	46
78.5								47	47	46
79.0										47
79.5										

\* Circumference Value = abdomen circumference - neck circumference (in inches)