Fitness Testing – Flexibility and Body Composition

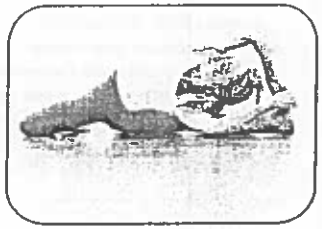
Flexibility

The sit and reach test

1. Perform a warm-up to help prevent injury.
2. Sit with your feet pressed up against the board and knees touching the floor.
3. Stretching your legs and lower back, touch the furthest distance possible on the sit and reach box.
4. Record your results and repeat three times, taking your average distance.

The Sit and Reach Test

This fitness test measures the flexibility of the hamstrings, hip and lower back and requires a 'sit and reach box'. It is important that the legs are kept straight and the knees not bent while performing the test. A short warm-up should be performed before the test to prevent injury which could occur when stretching the hamstrings. This test is usually measured in centimetres (cm) or inches (in)



Recreational activities such as yoga may require flexibility

Gymnastics relies heavily on good flexibility

Average sit and reach scores for 16–19 year olds (centimetres)

Gender	Excellent	Above average	Average	Below average	Poor
Males	>14	14.0–11.0	10.9–7.0	6.9–4.0	<4
Females	>15	15.0–12.0	11.9–7.0	6.9–4.0	<4

Source: Davis et al. 2000

Advantages ✓	Disadvantages ✗
• It is a reliable and valid way to assess flexibility • The only equipment required is a 'sit and reach box' • It is a quick way of assessing flexibility • There is a lot of data for comparing results	• There is a relatively high risk of injury if the athlete overstretches when trying to improve test results • It only measures the flexibility of the hamstrings and lower back muscles • Comparisons are difficult to make between individuals due to differences in limb and trunk length

Body composition

Tests that measure body composition

1) Body Mass Index
2) Bioelectrical Impedance Analysis
3) Skinfold Testing

1) **Body Mass Index:** Also known as **BMI**, this simple test involves predicting percentage body fat based upon weight and height. The calculation used to measure BMI is as follows:

BMI (kg/m²) = Weight (kg) ÷ [Height (m) X Height (m)]

Advantages ✓	Disadvantages ✗
• The only equipment required is weighing scales (to measure weight) and a tape measure (to measure height) • Quick and easy	• This test is not valid as it doesn't take into account that weight is based upon muscle mass and fat. Therefore, a body builder may have the same BMI as someone who is obese.

2) **Bioelectrical Impedance Analysis:** Also known as **BIA**, this test uses a machine that conducts a small electrical current through the body that is used to predict percentage body fat. This test is based upon the principle that fat conducts electricity less freely than muscle and other tissues found in the body.

Advantages ✓	Disadvantages ✗
• This test is a valid way of measuring % body fat • Can be a quick method	• It requires expensive equipment (BIA machine) • Hydration can affect the validity of the results so pretest requirements, such as not drinking or eating four hours before the test, are important

3) **Skinfold Testing:** This technique involves predicting percentage body fat based upon measurements taken from the body using skinfold calipers. Measurements for males should be taken at the chest, abdomen and thigh, while measurements for females should be taken at the triceps, suprailiac and thigh. The measurements (mm) are then added and compared to a % body fat nomogram.

Advantages ✓	Disadvantages ✗
• This test is a valid way of measuring % body fat • Inexpensive method and simple to perform	• It requires a precise method and correct interpretation of the results • Can be inaccurate if callipers are not used correctly