



Procedures for taking physical measurements

Dr Diane Cooper

PhD Exercise physiology and metabolism

Partner in True Fitness

Coordinator & lecturer on BSc Sports Science, AIT

Metabolic researcher on European Space Agency funded bed rest studies



Introduction

- Physical measurements tell us a lot about our cardiovascular and metabolic health.
- There are many simple measurements that you can take at home with minimal equipment that will paint a good picture of your health.
- The measurements include
 - 1) Body weight
 - 2) Body mass index (BMI)
 - 3) Waist circumference
 - 4) Abdominal circumference
 - 5) Hip circumference
 - 6) Waist to hip ratio (WHR)
- To take these measurements you will need (i) a weighing scales and (ii) a simple measuring tape.

Note:

- It would be preferable to also assess your body composition, which details the amount of muscle mass and fat mass that you have, but this type of measurement requires expensive equipment and technical skill.
- We perform these measurements routinely in studio, but the simple measures outlined above will be enough to tell you a lot of information about your health.

Introduction

- The following slides will detail:
 - The procedure you should follow to accurately take the recommended measurements.
 - The normal healthy ranges to aim for to ensure that you are in good metabolic and cardiovascular health.
- The target ranges are set based on years of research that has been conducted world wide.
- Research clearly and consistently shows that high BMI and high abdominal and waist circumferences, especially in inactive individuals, increase the risk of developing chronic conditions including type 2 diabetes and cardiovascular disease.
- In clinic, we generally see that our participants who have the highest BMI's, waist circumferences and abdominal circumferences also have the highest cholesterol, blood pressure and fasting glucose levels.
- However, when their physical measurements decrease during and after our **True Transformation** programme, this also results in reductions in blood pressure, blood sugar, and risk factors for type 2 diabetes and cardiovascular disease.

1. Body Weight

To accurately take your body weight you should:

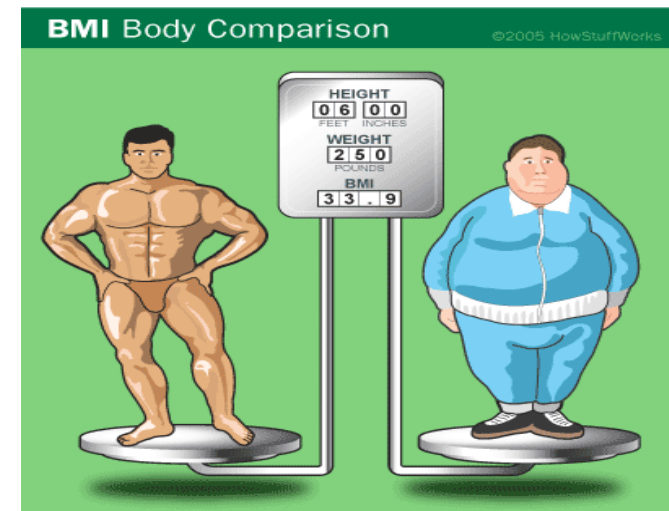
- ✓ Weigh yourself first thing in the morning, after using the toilet and before having any breakfast.
- ✓ Stand on the scales in minimal clothing.
- ✓ Each scales will be calibrated slightly differently and so will read slightly differently. You should use the same scales each time to weigh yourself.
- ✓ Body weight can increase by up to 5lbs between morning and evening due to undigested food and other issues, so it is very important to take the measurement first thing in the morning if possible.
- ✓ You should weigh yourself at the same time of the day, on the same day each week.
- ✓ You should only weigh yourself once peer week maximum!



Is body weight a good measurement to focus on?

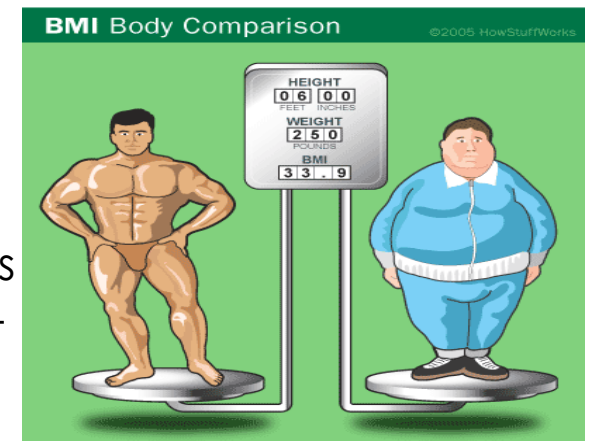
No, not on it's own.

- A measurement of body weight only tells you your total weight.
- It does not tell you what your weight consists of e.g. the amount of muscle mass and fat mass that you have.
- Two people can have the same body weight but can have very different body compositions and thus health.
- The individuals in the picture below have the same body weight, but one of them has high muscle mass and low fat mass (healthy), and the other has high fat mass and low muscle mass (unhealthy).
- You need more information than just body weight!



Is body weight a good measurement to focus on?

- Our clients who were previously inactive prior to **True Transformation** sometimes experience a plateau in weight loss at different points in time.
- When you start training for the first time muscles can become bigger and increase in weight. This is a normal healthy process. In some cases the weight gained in muscle can offset the weight lost in fat mass so when you look at the scales it looks like you have not lost any weight, when in fact you have had major improvements in your body composition and health.
- Unless you are following a strict body building programme the gain in muscle will be small and will settle at it's new level over the first few weeks to couple of months.
- So if you take your weight one week and there is no change, **don't panic**, this can be a normal response to training and it will change in time.
- It is important to take your body weight, body composition (if possible), and body measurements to get a better picture of the actual changes that are occurring in response to **True Transformation**.



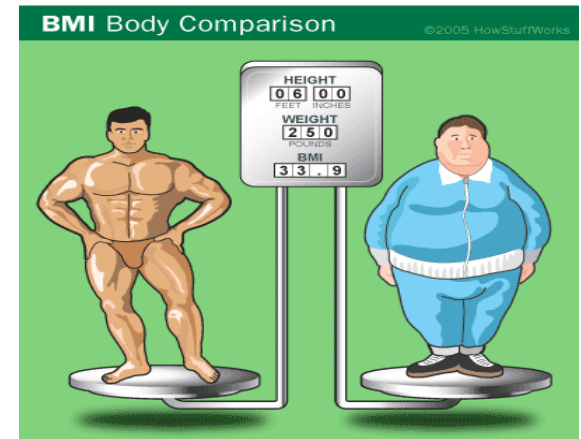
2. Body Mass Index (BMI)

- BMI is a simple way to assess body weight category.
- BMI takes into account your weight relative to your height.
- It is calculated using the following equation:
$$\text{BMI} = \text{weight (kgs)} / \text{height (m}^2\text{)}$$
- To use the equation your weight must be in kilograms and your height must be in meters squared
- Alternatively you could use an online BMI calculator.
- Clinicians and researchers use this measurement to evaluate if a person is normal weight, overweight or obese.
- In inactive people with poor lifestyle habits, as BMI increases the risk of type 2 diabetes and cardiovascular disease and cancer also increase.

BMI Classifications

- However, we do need to be careful of our interpretation of BMI since it only considers total body weight and does not distinguish between fat mass and muscle mass.
- For this reason, fit and muscular individuals who are heavy can be categorised as being overweight or obese, when clearly they are not.
- In the picture below both individuals have a BMI of 25kg/m² but they are both in two very different positions in terms of their body composition and their health!
- The following table shows the ranges for normal, overweight and obese BMI.
- Ideally your BMI should be 20-25kg/m²

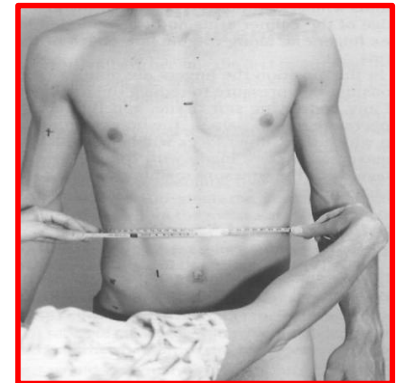
Weight	BMI (kg/m ²)	Class
Underweight	<18.5	
Normal weight	18.5 - 25.0	
Over weight	25.0 - 29.9	
Obese	30.0 - 34.9	I
	35.0 - 39.9	II
	≥40.0	III



3. Waist Circumference

- Research shows that waist circumference is an important measure of health.
- A healthy waist circumference is ≥ 40 in / 102cm for men.
- A healthy waist circumference is ≥ 35 in / 88cm for women.
- ✓ To take your waist circumference simply measure the narrowest point between your ribs and the top of your hips.

- ✓ It's a good idea to look at a front view and side view of your technique in the mirror to ensure the tape is positioned correctly.



4. Abdominal Circumference

- ✓ This measurement is usually taken at the widest part of the abdomen at the level of your umbilicus (belly button).
- ✓ It's a good idea to look at a front view and side view of your technique in the mirror to ensure the tape is positioned correctly.



5. Hip Circumference

- ✓ This measurement is taken at the maximal circumference of the gluteal muscles (buttocks).
- ✓ It's a good idea to look at a front view and side view of your technique in the mirror to ensure the tape is positioned correctly.



6. Waist-to-hip Ratio (WHR)

- This measurement is used as an indicator of abdominal fat.
- It is calculated by:
 - Circumference of your waist / circumference of your hip
- Individuals with greater amounts of central or abdominal fat are at increased risk of developing high blood pressure, type 2 diabetes, and a range of cardiovascular diseases.

The recommended WHR for men is > 1.0

The recommended WHR for women is > 0.8

Other Circumferences

- You could also take the following circumferences if you wish

Arm Circumference

- ✓ Measure the largest circumference in the middle of a flexed bicep muscle.



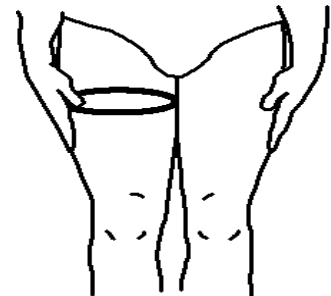
Chest Circumference

- ✓ This measurement should be taken at the nipple line.



Thigh Circumference

- There are different ways of doing this.
- ✓ Taking a measurement 20cm above the knee is one method you can use.



Case Study Example

Calculate

1. Body mass index (BMI)
2. Waist to hip ratio (WHR)

Mr X

- 5ft 11inches
- 13 stone
- Waist circumference 110cm
- Hip circumference 125cm

1. BMI

$BMI = \text{weight (kgs)} / \text{height (m}^2\text{)}$

$BMI = 82.7\text{kgs} / 3.24\text{m}^2$

$BMI = 25.5\text{kg/m}^2$

Notes:

- 13 stone = 82.7kgs
- 5ft 11inches = 180cm = 1.8m = 3.24m²
- You can use online converters if you need to

2. WHR

$WHR = \text{waist circumference} / \text{hip circumference}$

$WHR = 110 / 125 = 0.88$

Your task!



- ✓ Take your body weight
- ✓ Calculate your BMI
 - You will need your height (m²) and weight (kgs) for this
- ✓ Record your waist, abdominal and hip circumference
- ✓ Calculate your WHR
 - You will need your waist circumference and your hip circumference for this
- ✓ Take the other circumferences if you wish
 - chest, thigh, arm
- ✓ Compare your values to the healthy ranges mentioned

