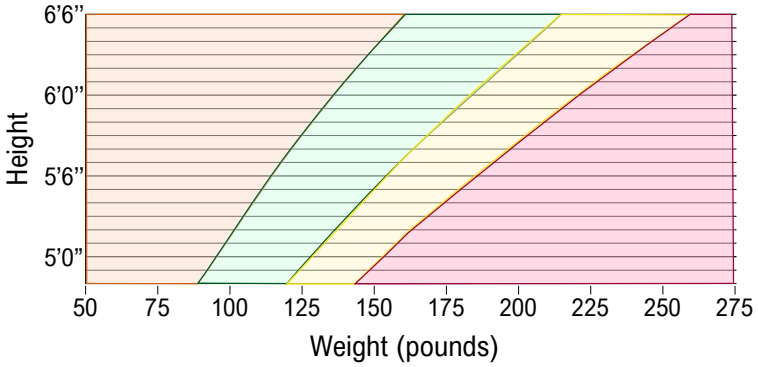
TOPIC: ASSESSING WEIGHT RELATED HEALTH RISK

Body Mass Index

- **Body Mass Index (_____):** a common and _____ tool for assessing health.
  - Take the ratio of body weight to height squared. $BMI = {}^{kg}/_{m^2}$
  - Gives a single number that falls into different categories.



Obese: BMI > _____.

Overweight: 25 ≤ BMI ≤ _____.

Healthy Weight: 18.5 ≤ BMI ≤ _____.

Underweight: BMI < _____.

- BMI has its limitations: best as a _____ indicator. Doesn't account for:
  - _____ body mass → many athletes have high BMIs.
  - Rates of bone & muscle loss → less accurate for people over 65 years old.
  - Other factors of _____ and health.

EXAMPLE

Use the formulas to calculate the BMI for the following two individuals. Using this value, how would one describe their weight? Are there any diseases this individual is at risk for based on their BMI?

$BMI = {}^{kg}/_{m^2}$

$BMI = \left({}^{lbs}/_{in^2}\right) \times 703$

Vivek	
Weight: 40 kg	**Height:** 1.5 m
BMI:	
Description:	
Vivek's BMI puts him at an increased risk of: _____	

Caroline	
Weight: 175 lbs.	**Height**: 62 inches
BMI:	
Description:	
Caroline's BMI puts her at an increased risk of: _____	

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PRACTICE

Being overweight is defined as:

a) Having a BMI between 20 and 35.

b) Having a BMI greater than 35.

c) Having a BMI between 25 and 30.

d) Having a BMI greater than 30.

PRACTICE

Amar is 6’ 3” (1.9 m) tall and weighs 245 lbs. (111 kg). According to his BMI, how would you describe Amar?

a) Underweight.

b) Healthy weight.

c) Overweight.

d) Obese.

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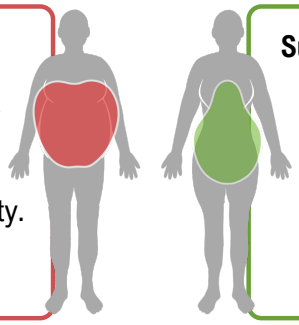
Body Composition

- Body composition is a _____ indicator of health than BMI on its own.
- **Body composition**: the relative amounts of lean body mass and fat body mass.
  - *Lean body mass:* body mass w/o _____ (muscles, bones, organs, water, etc.).
  - *Fat body mass*: _____ tissue: ideally _____ for males & _____ for fema-
    - High fat body mass is associated with poor health outcomes.
- Not all body fat is created equal:

Visceral fat: fat found around _____.
- **Central Obesity:** carrying excess weight around the midsection
- _____ **distribution** = ___ central obesity.
- ___ risk for chronic disease.



Subcutaneous fat: fat found under _____.
- "_____" fat
- _____ **distribution** = ___ central obesity.
- ___ risk for chronic disease (compared to high visceral fat).

PRACTICE

Which of the following are part of lean body mass?

I. Muscle.
II. Visceral organs.
III. Fat.
IV. Blood.

a) I, II, & III.
b) I, II, & IV.
c) I, III, & IV.
d) II, III, & IV.

PRACTICE

Which of the following is most associated with a *higher* risk of chronic disease?

a) High central obesity.
b) High subcutaneous fat content with lower visceral fat content.
c) High lean body mass.
d) Pear-shaped fat distribution.

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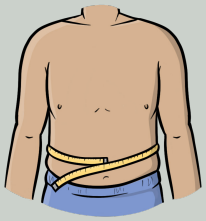
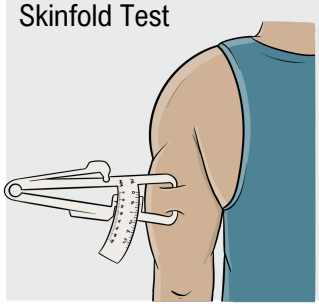
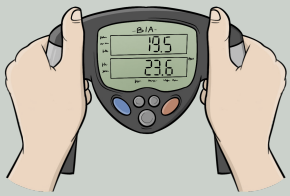
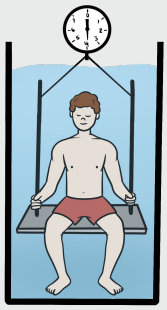
Methods for Measuring Body Composition

◆ Other methods for assessing health risk look at fat distribution and body composition.

Method	How it works	Pros	Cons
Waist Circumference 	Measures central obesity by measuring the smallest point of the natural waist. Women < ____ in. Men < ____ in.	◆ Easy to perform. ◆ Inexpensive. ◆ With _____ gives good disease risk assessment.	◆ Doesn't directly determine body _____.
Skinfold Test 	Specialized calipers measure the _____ of subcutaneous fat at different body parts.	◆ Easy to perform. ◆ _____.	◆ Can be less accurate.

Method	How it works	Pros	Cons
Bioelectrical Impedance 	Sends low-level electrical current through the body. Higher conduction rate = greater _____ body mass.	◆ _____. ◆ Can be integrated into household scales.	◆ Less accurate. ◆ Individuals must be adequately hydrated, not have eaten or exercised recently, and not have had alcohol for 48 hours.
Underwater Weighing 	The individual is weighed in and out of _____. Difference can be used to calculate amount of ____.	◆ More accurate.	◆ Individuals must be comfortable in water. ◆ Individuals must refrai from eating, drinking, & exercise before test. ◆ Requires specialized equipment.

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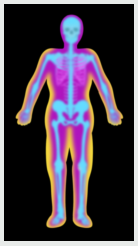
Method	How it works	Pros	Cons
Air Displacement Pod 	Amount of air displacement is measured and used to calculate body _____.	◆ Accurate. ◆ Easier than other displacement methods.	◆ Individuals may not fit in the machine. ◆ Requires specialized equipment.
Dual Energy X-ray Absorptiometry 	Low level Xray over the entire body differentiates lean tissue, _____, and fat.	◆ Accurate. ◆ Can assess bone density at the same time.	◆ Expensive. ◆ Individuals may not fit in the machine. ◆ Requires specialized equipment & technician.

EXAMPLE

For each of the following situations, fill in which body composition measure or measures would be appropriate to use.

1. A doctor who wants to assess the risk for cardiovascular disease in her patients but has limited space in her office: _____
2. A personal trainer who wants to measure the body composition of their clients before and after a six-week training program: _____
3. A research scientist wanting to assess the effect of GLP-1 inhibitors on body composition: _____

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PRACTICE

Which of the following techniques for measuring body composition relies on sending a low level electrical current through the body?

a) Dual energy X-ray absorptiometry.
b) Air displacement pod.
c) Skinfold test.
d) Bioelectrical impedance.

PRACTICE

Which statement below best describes strengths or weaknesses of using waist circumference as a health indicator?

a) Waist circumference is an inexpensive but accurate measure of body composition.
b) Waist circumference is often used because it is inexpensive but is generally not a good indicator of health because it fails to measure subcutaneous fat content.
c) Waist circumference is strongly correlated with BMI, so can be used in place of body mass index as an indicator of health when needed.
d) Waist circumference can be a good indicator of central body mass, and when used with BMI, can be an accurate tool to assess health risks.