

Overweight, Obesity, & Weight Loss/Maintenance

(**Read ACSM p.318 - 322 & Bb handout on Weight Loss/Regain)

- ❖ **Somatotypes** → a category to which people are assigned according to the extent to which their bodily physique conforms to a basic type.
 - **Ectomorph** (skinny, lean person)
 - Kasper
 - Under/normal weight, low LBM (Lean Body Mass), low FM (Fat Mass)
 - **Mesomorph** (person with greater than average muscular development)
 - Kasper on steroids
 - “think “M” for “Muscle”
 - Over-weight, high LBM, low FM
 - **Endomorph** (person with great deal of body fat)
 - Obese Kasper with or without steroids
 - “Bigger” athletes
 - Obese, high or low LBM, high FM
- ❖ **Basic calculation using LBM and FM:**
 - $LBM + FM = \text{total mass (scale weight)}$
 - $80 \text{ lbs} + 20 \text{ lbs} = 100 \text{ lbs (total weight)}$
 - So this person would have 20% FM.
- ❖ **What is overweight?**
 - A deviation in body weight from some standard or “ideal” weight (usually related to height or body surface area).
- ❖ **Classification of disease risk based on BMI and waist circumference (p.62; table 4.1)**
 - Classification vs. BMI (kg/m^2)
 - Underweight: < 18.5
 - Normal: $18.5 - 24.9$
 - Overweight: $25.0 - 29.9$ (high disease risk)
 - Obesity class I: $30.0 - 34.9$ (high/very high disease risk)
 - Obesity class II: $35.0 - 39.9$ (very high disease risk)
 - Obesity class III: ≥ 40.0 (extremely high disease risk)
 - *Important numbers that Kasper said to remember: overweight is ≥ 25 ; obese is ≥ 30 .
- ❖ **How to calculate BMI (example):**
 - Patient: height = 5'11"; weight = 104.5 kg
 - $5'11" = 71 \text{ inches}$
 - $71 \text{ inches} \times 0.0254 = 1.80 \text{ meters}$
 - $(1.80 \text{ m})^2 = 3.24 \text{ m}^2$
 - $104.5 \text{ kg} / 3.24\text{m}^2 = 32.25 \text{ kg}/\text{m}^2$

❖ What is obesity?

- Excess body fat?
 - Will use BMI values to determine this.
 - Not the best way to define obesity → we know excess fat is bad, but we don't know exact BMI numbers to consider for obesity → there are too many variables (race, background, etc)
- Percent of body fat that increases disease risk?
 - Also not the best way to define obesity → reduction in percentage of body fat sometimes helps prevent disease risks, but we do not have hard data to back this up yet.
- Distribution of body fat that increases disease risk?
 - This is the *best* way to define obesity → "apple" shape is worse than "pear" shape in terms of increasing disease risk...distribution (shape) is a better indicator than just overall percentage of body fat.

❖ Relationship between BMI & CVD mortality & risk of type 2 diabetes, etc.

- RR of death increases as BMI increases.
- Age-adjusted RR for type 2 diabetes increases as BMI increases.
 - Age-adjusted RR for diabetes begins to increase at BMI values that are considered "normal" for men (24 kg/m²) and women (22 kg/m²).
- Relationship between BMI and percent body fat
 - General rule: the more weight a woman puts on, the more likely it is that she put on fat mass.
 - Otherwise, there is a lot of deviation/error in this relationship (not a strong correlation).
 - You can relate to this: some guys may be extremely muscular, yet they have the same BMI as some guys that are fat. (Muscles weigh more than fat...so a high BMI doesn't mean there's automatically a high percent of body fat...it might be muscle).

❖ Fat distribution (body shapes)

- Android (from Greek: -Andri = man, male)
 - Upper body
 - Central
 - Truncal (trunk)
 - Male pattern
 - "apple" shape → big belly (trunk area)
- Gynoid (from Greek: -Gyne = woman)
 - Lower body
 - Peripheral
 - Female pattern
 - "pear" shape → big thighs, hips & ass (lower body)
 - ...once women hit menopause, they start putting body fat on the way a male would ("apple" shape) → this increases their risk for CVD (remember how "apple" shape is worse.)

❖ Waist circumference (p.66; box 4.1)

- Correlates highly with visceral fat
- Strong association with risk of disease
- Simple and convenient method

- Standardized protocol for administration (procedures):
 - All measurements should be made with a flexible yet inelastic tape measure.
 - The tape should be placed on the skin surface without compressing the subcutaneous adipose tissue.
 - If a Gulick spring-loaded handle is used, the handle should be extended to the same marking with each trial.
 - Take duplicate measures at each site and retest if duplicate measurements are not within 5 mm.
 - Rotate through measurement sites or allow time for skin to regain normal texture.
- ❖ **Dr. Kasper's "Basketball Theory"**
 - If a patient has a big "basketball" belly, you can't grab their fat very easily (mostly skin).
 - Abdominal fat is associated with visceral fat...however; you are not able to grab what is the majority of their fat (visceral), b/c of their stomach. (I know this may sound ridiculous, but imagine trying to use a caliper on someone with a potbelly...you're not going to be able to get their "deep" fat (visceral), only their taught skin on the outside (subcutaneous).
 - The "skin"/subcutaneous fat that you are able to grab is going to give a much lower BMI than what their actual BMI is. (Subcutaneous fat isn't nearly as bad as visceral fat...that's why this is such a problem).
- ❖ **The correlation between waist circumference & visceral fat:**
 - A correlation of 0.74...which is pretty good considering it's hard to find direct correlations.
- ❖ **Risk criteria for waist circumference in adults (p.66; table 4.3)**
 - Risk Category vs. Waist Circumference
 - Very low: women < 70 cm; men < 80 cm.
 - Low: women 70-89 cm; men 80-99 cm.
 - High: women 90-110 cm; men 100-120 cm.
 - Very high: women > 110 cm; men > 120 cm.
 - Note that the "High" category is consistent with ACSM Risk Stratification Threshold for Obesity.
 - On that note, realize that once someone is in the high risk category, you know that the patient's risks are going to increase ...so if a woman is at 90 cm or a male is at 100 cm waist circumference, things need to change. (*these are the numbers Kasper cares about).
 - When taking a patient's waist circumference: measure in between the umbilicus (belly button) and xiphoid process (lower part of the sternum).
- ❖ **Body Composition**
 - "Although national standards have been developed and accepted for BMI & waist circumference, none exist for estimates of body fat percentage [for health]".
 - Depends on:
 - Performance
 - Health
 - Age
 - Gender
 - Lifestyle
 - "Interpretations of body fat percentage estimates are complicated by three factors..."