Fitness Evaluation: *Muscular Fitness, Flexibility, and Body Composition*

EXS 150 – Chap 2b

Muscular Fitness: *Why*

- Improves and/or maintains:
  - Fat-free mass and resting metabolic rate
  - Bone mass/density
  - Glucose intolerance
  - Musculotendinous integrity (stability)
  - Activities of daily living

Muscular Strength Vs. Endurance

- Strength – maximal force generated by a muscle group
  - 1-repetition max (**1-RM**)
  - Most common are bench press and leg press
  - Table 2.7 for norms

- Endurance – ability of a muscle group to execute repeated contractions over **time** to cause fatigue
  - Examples: Push-ups and Curl-ups
  - Tables 2.9, 2.10, and 2.11 for norms

Muscular Fitness Tests:
Key points for administration

- Safety
  - Make sure to complete a dynamic warm-up
  - Familiarization – practice the technique a few times before actually doing the test!
- Specificity – remember that the tests describe fitness specific to a particular muscle group
- Absolute Vs. Relative Strength (1-RM) (p. 27)

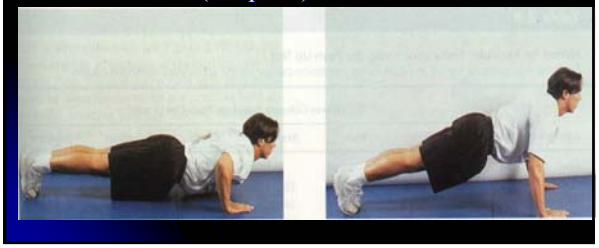
$$\text{Relative strength} = \frac{\text{1 RM weight}}{\text{body weight}} \times 100$$

Muscular Strength Tests

- Bench Press
- Leg Press
- Hand–grip: Demo

Muscular Endurance Tests

- Push-Up Test – m. fitness test designed to evaluate muscular endurance of shoulder and arm muscles (see p. 30)



Muscular Endurance Tests (con't)

- Sit-Up Test – a field test to evaluate abdominal muscle endurance (see p. 30-31)

- Curl-Up Test – modified sit-up test (see p. 31-32)

Flexibility

- Ability to move joints freely though their full range of motion
- Determine the ability to carry out activities of daily living, recreational, or sport activities
- Flexibility is joint specific
- Most common sites of assessment
  - Neck, trunk, hip, and shoulder
  - Why??

Flexibility Tests

- Sit and reach test – measures the ability to flex the trunk (low back and hamstrings) (see p. 34, Tab. 2.12)

- Shoulder flexibility - shoulder range of motion (see p. 35, Tab 2.13)

Contraindications: *Muscular Fitness and Flexibility*

- Muscular Fitness (strength)
  - Elderly
  - Hypertensive patients
- Flexibility
  - Make sure to note any musculoskeletal injuries that may be exacerbated by ROM testing
    - Ex. **Muscular Fitness:**

Body Composition

- Relative percentage of body weight that is fat and fat-free tissue
- Related to rates of chronic disease
- Desirable level of body fat (Tab 2.16)
  - Males – 13 to 18%
  - Females – 20 to 26%

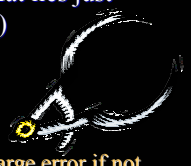
  } **WHY??**
- Borderline obesity
  - Males – 25%
  - Females – 30%

Body Composition: *Methods*

- Densitometry – based on mass/volume ratio
  - Hydrostatic weighing (Gold Standard) – a method of determining body comp that involves weighing the individual both on land and in a tank of water
- Anthropometric Methods
  - Skinfold measurements
  - Waist-to-Hip Circumference
  - Body Mass Index

Estimation of Body Fatness

Skinfold test - estimates body fat based on the fact that over 50% of the body fat lies just beneath the skin (subcutaneous)



- See p. 36-37 for administration
- Table 2.14 and 2.15 for norms
- IMPORTANT! - Potential for large error if not careful

Sites for Skinfold Test

Men

Women

Field Tests for Body Fatness

- Waist-to-Hip ratio – a high waist to hip circumference ratio indicates high risk of disease (hypertension, diabetes, high cholesterol)
  - See p. 40 for administration
  - Table 2.17 for norms

Field Tests for Body Fatness

- Body Mass Index – ratio of body weight (kg) to height (m)
  - Useful technique for testing population
  - Table 2.18 for norms
  - **BMI = weight (kg) / height (m^2)**
  - **1 kg = 2.2 pounds; 1 m = 39.25 inches**
    - Example: weight = 142 lbs, height = 67.5 inches
    - 142 lbs = _____kg 67.5 in =_____m = ___m^2
    - BMI = _____