Physical Fitness

Physical Fitness is the ability of the body systems to work together efficiently

Why do people exercise? Why not? What happened in 1943?

KRAUS-WEBER TEST

Why was this study so important to the United States?

KRAUS-WEBER TESTS OF MINIMUM MUSCULAR FITNESS

TESTED - 4458 AMERICAN CHILDREN 3156 EUROPEAN CHILDREN

1954 RESULTS

57.9% - AMERICAN CHILDREN FAILED

8.7% - EUROPEAN CHILDREN FAILED

THE MEASURABLE ELEMENTS OF PHYSICAL FITNESS

SKILL-RELATED FITNESS

Agility Cardiorespiratory Endurance

Balance Musculoskeletal

Coordination Flexibility

Speed Muscle Strength

Power Muscular Endurance

Reaction Time Body Composition

THE SPORTS CONTINUUM

Soccer Basketball Tennis

Bowling Handball Calisthenics

Fencing Skating Cross Country Skiing

Golf Racquetball Rope Jumping

Table Tennis Soccer Hiking

Volleyball Squash Bicycling

Baseball Football Running

Downhill Skiing Swimming

Tennis Walking

WEIGHT TRAINING
Measurable Elements of Physical Fitness

Skill-Related Fitness
- Agility
- Balance
- Coordination
- Speed
- Power
- Reaction Time

Health-related Fitness
- Cardiorespiratory Endurance
- Musculoskeletal
  - Flexibility
  - Muscular endurance
  - Muscular strength
- Body Composition

AGILITY
- Quick and easy movement
- Movement in a controlled fashion
  - Pro agility run
  - Side shuttle
  - Line jump
BALANCE

• Stability
• State of equilibrium
  – Stick balance
  – Backward hop
  – One-leg squat

COORDINATION

• Using senses to be smooth
• Complex movement
  – Double ball bounce
  – Juggling

SPEED

• Ability to perform in a short period of time
• Rapid movement
  – Short sprint
  – Double heel click
POWER
• Energy transfer in a short time
• The ability to exert force
  – Standing long jump
  – Knees to feet
  – Ball toss

REACTION TIME
• Lapse of time between a stimulus and a response
  – Yardstick drop
  – Coin catch

Measurable Elements of Physical Fitness
Health-related Fitness
• Cardiorespiratory Endurance
• Musculoskeletal
  • Flexibility
  • Muscular endurance
  • Muscular strength
• Body Composition
CARDIORESPIRATORY ENDURANCE
- Exercise of the heart and lungs
- Ability of the heart, lungs and blood vessels to deliver adequate amounts of oxygen to meet demands
  - Burns fat as a primary energy source
  - Max Heart Rate: \(220 - \text{age} = \text{Max H.R.}\)
  - Target heart range: 60% to 85% of Max H.R.
  - Heart rate measured in beats per minute

Types of cardiorespiratory endurance exercises:

FLEXIBILITY
- Range of motion of muscle and joints according to muscle length
  - Factors that determine flexibility
    - Length of muscle
    - Length of tendon
    - Length of ligament
  - Types of stretches to increase flexibility:
    - Active – movement based
    - Static - stationary

MUSCULAR STRENGTH AND ENDURANCE
- Strength – ability of a muscle to exert maximum force against a resistance
- Endurance – ability of a muscle to exert sub maximal force repeatedly over time
  - Ways to increase strength & endurance
    - Isometric – of the same length
    - Isotonic – of the same tension
    - Isokinetic – of the same force
BODY COMPOSITION

- Fat and non-fat components of the body
- How much of the body is lean muscle and how much is fat mass
- Calorie expenditure – the amount of calories used
  - What is a calorie: energy in food (the amount of energy needed to raise the temp. of 1 gram of water 1 degree Celsius)

BODY COMPOSITION

- Types of body fat mass
  - Essential body fat percentage
    - 3% for males
    - 12% for females
  - Over fat percentages
    - +25% for males
    - +30% for females
- Obesity - critical health problem in the U.S.

BODY COMPOSITION

- Factors that determine body weight
  - Diet
  - Activity
  - Body size (girth)
  - Heredity
  - Gender
  - Set-point theory
BODY COMPOSITION

• How to determine body composition
  – Skin calipers
  – Body mass index
  – Bioelectrical impedance
  – Hydrostatic weighing
  • Which is the most accurate?
  • Which is the oldest?

287-212 B.C.

SKIN CALIPPERS

BODY MASS INDEX

![BMI Chart](image)

Figure 1: Adult Body Mass Index

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Healthy Weight | Overweight | Obese
What is anorexia?
- An eating disorder when people starve themselves
- Usually begins around the onset of puberty
- Weight loss is usually 15% below the person's normal body weight
- Anorexics have an intense fear of becoming fat
BODY COMPOSITION

• Symptoms of anorexia
  – Not wanting or refusing to eat in public
  – Anxiety
  – Weakness
  – Brittle skin
  – Shortness of breath
  – Obsessiveness about calorie intake

• What is bulimia?
  – Also called bulimia nervosa
  – Is a psychological eating disorder
  – Characterized by episodes of binge-eating followed by inappropriate methods of weight control (purging)
  – Inappropriate methods include: vomiting, fasting, excessive use of laxatives
BODY COMPOSITION

• Binge eating is usually a response to depression, stress, or self-esteem issues
• Complications from Bulimia
  – Erosion of teeth, cavities
  – Dehydration, electrolyte imbalance
  – Swelling or soreness in the salivary glands
  – Ulcers
  – Irregular heartbeat
  – Increased rate of suicide

BODY COMPOSITION

• Bulimia statistics:
  – Affects about 10% of college age women
  – 10% of all case are men
  – 10% of individuals suffering from bulimia will die from either starvation, cardiac arrest, other medical complications, or suicide