

# Fitness

What is it?

Why is it important?

# Fitness

- Refers to state of the body
- The ability of the body to adapt to the demands and stress of physical activity
  - This can be measured and evaluated
  - Norms have been established and deviation from those norms have consequences
- Physical activity is any movement of the body that is carried out by skeletal muscles and that requires energy to produce

# What do you measure for fitness

- Cardio-respiratory endurance
- Muscular Strength
- Muscular Endurance
- Flexibility
- Body Composition

# Cardio-respiratory Endurance

- The ability to perform prolonged, large muscle, dynamic exercise at a moderate-to-high level of intensity
- Physiology
  - Lungs deliver oxygen, heart pumps blood, nervous system and blood vessels regulate blood flow, and capacity of the body's chemical process to use oxygen that has been delivered
- Low levels linked to CVD

# Muscular Strength

- The amount of force a muscle or group of muscles can produce with a single effort
- Greater strength means easier to perform activities
- In addition greater strength leads to increase in metabolism

# Muscular Endurance

- The ability to sustain a given level of muscle tension or hold a contraction for a long period of time or repeat over and over
- If not able to repeat action due to muscle fatigue can lead to poor form or possible injury

# Flexibility

- The ability to move the joints through a full range of motion
- Inactivity causes the joints to become stiffer. Stiffness leads to loss of ROM leads to less activity leads to stiffer leads to less ROM leads to less activity

# Body Composition

- Refers to the relative amount of fat-free mass (muscle, bone, water) and fat in the body
- Is independent of body weight
- Obesity leads to health problems; CVD, HBP, Stroke, Joint problems, Diabetes, Gallbladder Disease, Cancer, Back Pain

# How do you know how fit you are?

- Measurement
- Each area of fitness can be measured and evaluated
- There are multiple measures for each area of fitness.
- Measurements can be evaluated by norm-referenced or criterion-referenced

# Norm-Referenced

- Take a test and your results are then compared to a specifically defined group
  - Your results are compared to others and you get a rank score
  - Usually given as percentile ranks
  - The high the rank the more fit you are
  - 50 percentile was used as the marker of concern, i.e. not fit

# Criterion-Referenced

- Take a test and your results are measured against a specific predetermined level of performance
- Moving more and more in this direction
- Scores are based upon an expert evaluation of what is needed to be achieved at each level of fitness

# Tests that are used in each area

- Cardio-respiratory

- 3 min Step test, rate at which pulse returns to normal
- 1.5 Mile Run-Walk, fast time correlates to higher  $\text{VO}_2$  max
- Cycle Ergometer, return of pulse to normal level after a bout of high power pedaling with a high load
- Pacer a progressive run, the longer you last the more fit you are
- $\text{VO}_2$  max test, single most reliable measure, is the measure of the maximal amount of oxygen that can be used by a person during an exhaustive bout of exercise

# Test cont.

- Muscular Strength
  - Bench Press, the amount of weight you are able to lift with one maximal effort divided by your body weight
  - Leg Press, same as above but utilizing the legs
  - Grip strength, the amount of force produced compared against established standards
  - Computerized Dynamometers, calculate maximal effort and endurance

# Test cont.

- Muscular Endurance
  - 60 Second Sit-up test or curl-up test, number of reps you are able to do compared to standards
  - Push-up test, number of reps compared to standards
  - Bench Press, max number of presses possible against a known load
  - Computerized Dynamometers, calculate maximal effort and endurance

# Test cont.

- Flexibility

- Sit and Reach test legs straight maximal distance reached in front, measured against a standard
- Trunk Lift, laying prone it is a measurement of the maximal height you are able to lift the chin off the ground
- Range of Motion assessment, visual comparisons of joint flexibility using a goniometer

# Test cont.

- Body Composition
  - BMI, height and weight comparison
  - Waist to hip Ratio, determines risk based for ratio and total size, rough estimate
  - Skin fold, measurement of the thickness of various skin-folds which is then calculated to compare with more precise lab techniques
  - Hydrostatic Weight, muscle has higher density and fat a lower density than water, gold standard test
  - DEXA, Dual Energy X-ray Absorptiometry, scan is done that can differentiate between muscle bone and fat

# How do you change (improve) fitness

- Greater demands placed on the body lead the changes to meet the demands if carried out over time the adjustments lead to long term changes
  - If you start to run what happens

# Physical Training for long term changes

- Specificity, the body adapts to the particular stress.
- Progressive overload, greater amounts of stress lead to changes
- Think F.I.T.
  - Frequency, 3 of times 3-5/wk cardio, 2-3/wk muscular
  - Intensity, must be harder than normal
  - Time, must occur over a period of time

# How do you get started

- Assessment
  - How do you know where to get to if you don't know where you are
  - Set goals
    - Must be specific and measurable
- To change fitness it requires Motivation, Locus of Control, Target Behavior

# Making a plan helps

- Monitor behavior
  - Gather data, track results over time
- Analyze data, ID patterns that lead you to where you are and where you are going
- Set specific goals
- Plan of action, modify environment, reward yourself, involve others
- Make a commitment, a contract is helpful some times

# Why physical activity matters

- Relative risk Assessment
  - Normal population no health risk other than sedentary
    - Rank them as 1.0
    - Begins a minimal program of exercise 0.63
    - More intensive exercise 0.51
    - Serious program 0.48