CARDIORESPIRATORY ENDURANCE

AHA 2020 “IMPACT GOALS”
- “By 2020, to improve the cardiovascular health of all Americans by 20% while reducing deaths from CVD and stroke by 20%”

IMPACT GOALS: HOW?
4 health behaviors
- Nonsmoking
- BMI less than 25
- Physical activity 150 minutes/week moderate intensity or 75 minutes/wk vigorous
- Dietary factors: high fiber, high omega 3, low trans fat

3 Health factors:
- Total cholesterol less than 200mg/dl
- FBG less than 100mm/dl
- Blood pressure less than 120/80

CARDIORESPIRATORY ENDURANCE
- Ability of the respiratory, circulatory and muscular systems to consume, distribute and utilize oxygen during continuous physical activity
- Evidence suggests that low CRF (cardiorespiratory fitness) is as strong a predictor of CVD as smoking, HBP, obesity and DM

INTRODUCTION
- Cardiorespiratory endurance
  - Most important component of health-related physical fitness
    - Exception among older adults where strength is more important
  - Aerobic exercise
    - Prevention of cardiovascular disease
      - Under stress- a poorly conditioned heart may not be able to sustain strain- i.e. shoveling, lifting, running in an emergency, etc

INTRODUCTION
- Technological developments
  - Minimize effort required of body
- Hypokinetic diseases
  - Hypertension, heart disease, low back pain, obesity
**BENEFITS OF AEROBIC TRAINING**

- Beneficial physiological adaptations
  - Higher maximal oxygen uptake (VO₂max)
    - Can exercise longer at greater intensity
  - Increase in oxygen-carrying capacity of blood
    - Red blood cell count goes up
  - Decrease in resting heart rate
    - Greater heart efficiency
  - Lower heart rate at given workloads
  - Faster recovery time
  - Lower blood pressure and blood lipids
    - Lower LDL, increase HDL, decrease Apolipoprotein B (a CVD marker)
  - Increase in fat-burning enzymes
  - Reduced risk of metabolic syndrome

**PRINCIPLES OF CARDIORESPIRATORY EXERCISE PRESCRIPTION**

- FITT guidelines
  - Frequency
  - Intensity
  - Type (mode)
  - Time (duration)

**FREQUENCY OF EXERCISE**

- Recommended frequency
  - 3 to 5 days per week
  - Initial recommendation
    - 3 sessions of 15 to 20 minutes
  - Frequency and duration should be increased before intensity

**INTENSITY OF EXERCISE**

- Older folks = 30%
- Beginners = 40-50%
- Average fitness = 50-60%
- Active and fit in the “good” fitness level = >60%
- Active and fit in the “excellent” fitness level = up to 85%

**HOW HARD ARE YOU WORKING?**

1. Measure maximum heart rate (MHR)
   - 207 - (.7 x age)
2. Measure resting heart rate
   - (after sitting quietly for 30 minutes)
3. Determine heart rate reserve
   - HRR= MHR - RHR
4. Calculate Training intensity (TI)
   - i.e. 70%TI = HRR x .70 + RHR

**HOW HARD ARE YOU WORKING?**

Let’s do me!

1. MHR = 207 - (.7 x 49) = 172.7
2. RHR = 60
3. HRR = MHR-RHR= 112.7
4. To exercise at a training intensity of 70%
   - 70%TI = (HRR x .70) + RHR
   - =112.7 x .70 + 60
   - = 78.89 + 60 = 138.89
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RATE OF PERCEIVED EXERTION (RPE)

- Alternative to checking pulse
- Rate of exercise difficulty
- Cross-check with target zone
- Reexamine periodically

MODE OF EXERCISE

- To develop cardiorespiratory system
- Aerobic exercise
- Involves major muscle groups
- Choose activities based on personal preferences

DURATION (QUANTITY) OF EXERCISE

- Exercise between 20 to 60 minutes per session
- 60-90 minutes daily may be required for weight loss/maintenance

EXCESSIVE SITTING: A DEADLY PROPOSITION

- If you spend most of your day sitting, your lifestyle may cancel out the health benefits of the 30-minute exercise session
- People who sit most of the day have up to a 50% greater risk of dying prematurely and an 80% greater risk of cardiovascular disease

EXCESSIVE SITTING: A DEADLY PROPOSITION

- Ways to enhance daily nonexercise activity thermogenesis (NEAT)
  - Stand as much as possible
  - Use a standing or a treadmill desk
  - Use a stability ball for a chair
  - Hold “walking” meetings
  - Walk to co-workers’ offices instead of phoning
  - Take intermittent breaks
  - Park farther away, and take the stairs