Dr. Joseph Libonati – Guest Speaker – December 2, 2010

- Aki talked about the goals of the club and its importance in the community of West Philadelphia
- Comes from the school of Nursing, not a nurse, Exercise Physiologist
  - Works with patients and athletes, children, people with heart conditions
  - Animal models – basic cell systems and how exercise effects the heart
  - "Of Mice and Men" - Translational Physiologist – take what you know and translate it to the human condition, he does this in terms of research
  - Physiology of exercise should be based upon scientific principles
  - Human performance
    - Strength/Power, Speed, Agility, Flexibility, Specific skills, Emotional/Psychological, Endurance – Topics that could be important to teach the children
    - He was a high school athlete, where his interest started
- Endurance and Exercise
  - Fick Equation – $VO_2 = Q \times AVO_2$ (where V is volume, Q is cardiac output – blood heart pumps out over time - multiplied by arterial venous oxygen extraction)
    - The muscles ability to extract that oxygen is important, muscles and circulation are also important, determine aerobic fitness
    - Measured in "mets" (3.5 mL of oxygen) – a function of capacity
    - Need more oxygen for more ATP for better performance
  - Aerobic metabolism – the volume of oxygen you can take into your body and use, oxygen is necessary for energy
- Heart Studies
  - Exercise training improves heart function in normal subjects!
  - Can exercise improve heart function in disease (hypertension and etc)?
    - Less is known, still being studied
- Definitions
  - Physical activity = bodily movement produced by contraction of skeletal muscle
    - Walking somewhere, every day physical activity (just movement) this is not exercise (increasing metabolism)
  - Exercise = subset of physical activity that in **planned**, structured, repetitive and purposeful
    - Resistance training, regimented and structured (subset of physical activity)
  - Physical Fitness = cardio-respiratory fitness, muscle strength, body composition and flexibility (MET)
- Many US Adults are Physically Inactive
  - 38% - Irregularly Active
  - 25% - Sedentary (not moving at all)
  - 22% - Regular, Sustained Activity of Any Intensity (5x/week, more than 30 minutes)
  - 15% - Regular Vigorous Activity (3x/week, more than 20 minutes)

- Study – by Influence of Cardiorespiratory Fitness and Other Precursors on Cardiovascular Disease and All Cause Mortality in Men and Women Aerobics Center Longitudinal Study - Blair
    - Relation of cardiorespiratory fitness to CVD mortality and all-cause mortality
    - Observational cohort study
    - Found that if you smoke but have a high level of fitness, you have a lower rate of dying than someone who has low fitness. Same with high blood pressure and cholesterol
        - Basically, greater activity = lower risk of death
- Recommendations for Adults
    - 30 to 60 of moderate intensity physical activity is required on most days of the week to reduce the risk of CAD event (moderate = walk and have a conversation without losing breath)
    - This is equivalent to 1.5 – 3.0 miles per day of brisk walking at an energy cost of 150 – 300 kcal per day for an average sized person
- How Fast? At What Intensity?
    - Do what you can do! Anything is better than nothing. More is better than the status quo.
- Obesity is an epidemic in the United States and has been increasing in percentage over time
    - Heart disease is the leading killer in men and women
- Cardiovascular Benefits of Healthy Diet, Weight Loss, and Exercise
    - Improves lipid profile, decrease blood pressure, decreases many other things as well
- What does exercise do to the body mass part of the equation?
    - Kcals you take in (food) MINUS Kcals you put out (activity – 30% of total, digestion – 10%, basal metabolism – 60%)
        - Muscle mass increasing (like weight lifting) helps your basal metabolism)
    - Ideal = 1500 per week (30 minutes a day, 5 times a week) whereas 3500 Kcal = 1 lb of fat
    - People overestimate how hard they are working out and how many calories they are expending
- Facts
    - A mile (walk or run) = 100 calories
    - Sitting = 60 calories
    - People get discouraged at slow weight
    - Caloric expenditure is elevate for about an hour post exercise
    - Fit people use fat better than unfit people (better oxidation and blood flow)
    - More fitness means more calories
    - Leaner muscle, more calories. Resistance training
    - Dieters who exercise also lose less lean body mass versus dieters without exercise – higher resting metabolic rate
- High intensity exercise is better for weight loss = burning more calories
- Exercise is related to caloric expenditure = more you expend, the healthier you can be
    - This is relative to an individual person – do what you can do
- What can you do?

    - Measure quality calories of food
    - Type of foods you are eating
    - Low glycemic food (fruits and vegetables, etc.)
- It can take 2 weeks to lose fitness capacity and 12 weeks to gain it back!