

Exercise: The Magic Bullet

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Recommended Reading (on Len's WEB site): Kravitz, L. (2007). The 25 most significant health benefits of physical activity and exercise. *IDEA Fitness Journal*, 4(9), 54-63. Kravitz, L. (2006). Vigorous versus moderate-intensity exercise. *IDEA Fitness Journal*, 3(8), 23-25.

I. Updated (2007) Physical Activity Guidelines from ACSM and AHA: Haskell, W.L. et al. (2007) Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Med. Sci. Sports Exerc.*, Vol. 39, No. 8, pp. 1423–1434.

- A. Men and women under age 65
- B. Moderate cardio 30 min/day, 5 days/week OR
- C. Vigorous cardio 20 min/day, 3 days/week AND
- D. 8-10 strength-training exercises (8-12 reps of each) 2 times/week (muscular fatigue)
- E. Moderate = brisk walk; physical activities that reasonable accelerate heart rate
- F. Vigorous = jogging; physical activities causing rapid increase in heart rate
- G. Men and women age 65 and over (or 50-64 with chronic conditions (ex. arthritis)
- H. Moderate cardio 30 min/day, 5 days/week OR
- I. Vigorous cardio 20 min/day, 3 days/week AND
- J. 8-10 strength-training exercises (10-16 reps of each) 2-3 times/week AND
- K. Balance exercises, if at risk of falling AND
- L. Have a physical activity plan

II. Health Benefits of Exercise: Kravitz, L. (2007). The 25 most significant health benefits of physical activity and exercise. *IDEA Fitness Journal*, 4(9), 54-63.

Reduced stress, depression and anxiety, lowered risk of stroke, lowered incidence of breast cancer in women, reduced (when elevated) blood pressure, increased function and mobility with less pain in arthritis sufferers, improved total cholesterol and LDL-cholesterol (aerobic exercise combined with weight loss), enhanced cardioprotection of cardiovascular disease, improved body composition and obesity management, maintained and/or increase bone mineral density for osteoporosis management, improved musculoskeletal health and prevention of sarcopenia, improved blood triglycerides and HDL-cholesterol (independently improved with aerobic exercise), lower incidence in colon cancer, better management and prevent of diabetes, enhanced self-esteem and mood state

III. Why doesn't everyone exercise?

- A. "Technology's sedentary seduction"
- B. 75% to 95% of day is seated: Hamilton, M.T., et al. (2008). Too little exercise and too much sitting: Inactivity physiology and the need for new recommendations on sedentary behavior. *Current Cardiovascular Risk Reports*, 2, 292-298.
- C. Cellular phones, dictaphones and lap top computers...exacerbate our hypokinetic state
- D. Economics: sedentary jobs pay good money
- E. Is there a way to get balance with work and exercise?
- F. Physical inactivity statistics: Centers for Disease Control and Prevention (2006). Physical activity for everyone: The importance of physical activity.

1. In 2007, 25% of US reported no activity during leisure time
 2. 50% do not accumulate 30 min of moderate activity on most days of the week
 3. 2/3 of students (grade 9 to 12) do not get 30 min of moderate activity on most days/wk
 4. Health care costs of physical inactivity are associated with \$150 billion dollars/year of direct and indirect expenditures; total health care costs in 2005 was \$2 trillion dollars or \$6,700 per person: Chakravarky, M.V. and Booth, F.W. (2003). Hot Topics: Exercise
 5. Risks of physical inactivity: increases risk of CAD 45%, stroke by 60%, HBP by 30%, colon cancer by 41%, breast cancer 31%, and osteoporosis by 59%: Booth, F.W. and Lees, S.J. (2007) Fundamental questions about genes, inactivity, and chronic diseases. *Physiological Genomics*, 28, 146-157.
 6. Studies show that 30-50% of all causes of type 2 diabetes, coronary heart disease, and many cancers are preventable by 30 min/day of moderate intensity exercise.
 7. Statements on inactivity from several leading health organization web pages
- G. How does being inactive cause disease? Molecular basis is unknown; prevention and treatment of inactivity caused chronic disease will be much more effective when we learn the molecular basis.
- H. New Findings
1. Too much sitting is hazardous to health
 2. Science of sedentary (Latin for 'to sit') behavior or 'inactivity physiology'
 3. Not the endpoint of physical activity continuum
 4. Adults/children spend $\geq 75\%$ of waking day working at a desk, riding in a car, eating a meal, playing video games, working on a computer, watching TV
 5. Canadian Fitness Survey: Mortality over 12-year period, 7,278 men and 9,735 women; 18-90 yrs.
 6. Leading causes of mortality: cardiovascular disease (CVD), cancer, respiratory diseases, injuries, nervous system disorders, accidents, and other
 7. Major finding: Strong association between sitting and mortality
 8. Mechanism: Sitting results in dramatic drops in lipoprotein lipase (captures fat from blood for fuel); this leads to soaring levels of triglycerides; too much sitting also results in lowered levels of HDL; elevates risk to CVD
- I. Where did we go wrong? A historical overview of the Greek and Roman civilization lifestyles
- J. What can we learn from the hunter-gatherer societies?
- K. Hunter-gatherer societies did much more daily physical activity to provide the basic necessities of life, such as food, water, shelter, and materials for warmth to survive: Booth, F.W. et al. (2002) Waging war on physical inactivity: using modern molecular ammunition against an ancient enemy, *Journal of Applied Physiology*, 93, 3-30. Hunter/gatherer men averaged 19.6-24.7 kcal/kg and women averaged 14.6 kcal/kg daily physical energy expenditure (above RMR).
- L. Modern society men average 4.4 kcal/kg and women average 4.2 kcal/kg daily physical energy expenditure (above RMR)
- M. Hunter-gatherer men vs. modern male: 1268 kcal difference in energy expenditure (daily life)

- N. Hunter-gather women vs modern female: 613 kcal difference in energy expenditure (daily life)
- IV. Where do we go from here?
- V. What leads people to exercise? Whaley, E.E. and Schrider, A.F. (2005). The process of adult exercise adherence. Self-perceptions and competence. *The Sport Psychologist*, 19, 148-163.
- A. Self-perception (affected by reinforcement, social support and positive feedback); belief exercise will improve self; S.M.A.R.T. goal setting; specific action plan to exercise
- VI. Why do people choose to 'retire' from exercise?
- A. 55% of men and women drop out of exercise with the first year: Heyward, V.H. (2006). *Advanced Fitness Assessment and Exercise Prescription*
 - B. Lack of time, fear of falling, self-conscious about appearance, poor health, bad weather, no (adequate) workout facilities, too weak to exercise, little support to exercise, no exercise partner, lack of energy (exercise is too tiring)
- VII. What motivates people to continue to exercise? Trost, S.G., et al. (2002). Correlates of adults' participation in physical activity: review and update. *Med. Sci. Sports Exerc.*, 34(12), 1996-2001.
- A. Psychological correlate is self-efficacy. The more people think they can successfully do exercise, the more likely they will adhere.
 - B. Behavior correlates: healthy diet, positive health outcomes from exercise, higher quality of life, believe can achieve more gains. Completing assessments and reporting improvements is critically important to encouraging a person to continue to exercise.
 - C. Social correlate is social support. Continue developing classes and programs (i.e., marathon clubs, boot camps, triathlon teams, running camps, etc.) of interested participants.
 - D. Physical correlates to exercise. Satisfaction with workout facilities; easy access to workout facilities, perceived safe equipment; 'Exercise leaders with high mastery of exercise favorably influence client exercise adherence. They are esteemed role models for their clients.
- V. Special topic: Is "More is Better" really validated in the research
- A. ACSM and AHA: Physical activity above the recommended minimum amount provides even greater health benefits
 - B. Swain, D.P. and Franklin, B.A. (2006). Comparison of cardioprotective benefits of vigorous versus moderate intensity aerobic exercise. *American Journal of Cardiology*, 97: 141-147.
 - C. Swain and Franklin (2006) reviewed epidemiologic studies (studies that report incidence or prevalence data) that assessed the benefits of physical activity as well as clinical investigations (studies that test and analyze results) that actually trained subjects at different intensities. They note that they included only studies where energy expenditure was controlled for in the research design. This was important because vigorous exercise elicits a greater energy expenditure than moderate exercise, and thus controlling for energy expenditure allows for the optimal way to assess the effects of aerobic exercise intensity.
 - D. All of the epidemiology studies that controlled for energy expenditure found greater cardioprotective benefits from the higher aerobic exercise intensities as compared to the moderate aerobic exercise intensities.

- E. Specifically, in relation to the coronary heart disease, the #1 cause of mortality in America, aerobic exercise of a more vigorous type resulted in lower incidence.

Famous Person Quotes:

Charles Schulz: “Jogging is very beneficial. It’s good for your legs and your feet. It’s also very good for the ground. It makes it feel needed.”

Hippocrates: That which is used develops, and that which is not used wastes away...If there is any deficiency in food or exercise, the body will fall sick.”

Arnold Toynbee: “..of the twenty-one great civilizations, nineteen of them fell because of physical and moral decay from within.”

John F. Kennedy: “Physical fitness is the basis for all other forms of excellence”

Anonymous: “Exercise: you don’t have time not to.”

Hippocrates: “If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health.”

Cher: “Nothing lifts me out of a bad mood better than a hard workout on my treadmill. It never fails. To us, exercise is nothing short of a miracle.”

Rudyard Kipling: “Nations have passed away and left no traces. And history gives the naked cause of it. One single, simple reason in all cases. They fell because their people were not fit.”

Thomas Jefferson: “Walking is the best possible exercise. Habituate yourself to walk very fast.”

Benjamin Franklin: “To lengthen thy life, lessen thy meals.”

Abraham Lincoln: “Always bear in mind that your own resolution to succeed is more important than any other thing.”

Paula Radcliffe: “I can’t imagine living and not running.”

Nadia Comaneci: “I don’t run away from challenge because I am afraid. Instead, I run toward it because the only way to escape fear is to trample it beneath your feet.”

Kenneth Cooper: “We do not stop exercising because we grow old—we grow old because we stop exercising.”

Len Kravitz: “The road to health and fitness has no finish line.”