



Latest Health Impact: Muscular Strength

Study links muscular strength to lower mortality

The link between exercise and reduced mortality risk is furthered now with a new prospective cohort study, published in the July 12, 2008 *BMJ*.

Lead investigator Jonatan R. Ruiz, from the Department of Biosciences and Nutrition at NOVUM in Sweden, and his research team examined the association between muscular strength and mortality from all causes, cardiovascular disease and cancer in men. They hypothesized that men with “higher levels of muscular strength would have lower rates of mortality than those with lower levels of muscular strength.”

Previous studies used a single measure of muscular strength; however, this latest study incorporated two. Muscular strength—which steadily declines with age just as functional aerobic capacity does—was quantified by “combining one repetition maximal measures for leg and bench presses per body weight” and categorized further as age-specific thirds of the combined strength variable; cardiorespiratory fitness (CRF) was assessed by a maximal exercise treadmill test.

A May 29 Medscape article by Laura Gater covered the American College of Sports Medicine 55th Annual Meeting, where Ruiz presented his findings. In the article, Ruiz said, “Muscular strength and CRF combine to provide protective effects against all-cause mortality in men” and that the study’s findings “prove the benefits of having

greater muscular strength and thus require further research to confirm effects of strength and CRF.”

Set at an aerobics center, the longitudinal study participants (8,762 men, ages 20-80) received a comprehensive medical examination and muscular strength tests at the Cooper Clinic in Dallas, Texas. The men went to the clinic for periodic preventive health exams and lifestyle counseling (nutrition, exercise and other lifestyle factors linked to increased chronic disease risk). The study subjects were “predominately white, well-educated and belonged to the middle- and upper-socioeconomic strata.”

Over the average 18.9-year follow-up, 503 deaths occurred: 145 cardiovascular disease; 199 cancer.

Resistance training and study findings. Researchers adjusted for age, physical activity, smoking, alcohol intake, body mass index, baseline medical conditions and family history of cardiovascular disease. Per the study . . .

- **Muscular strength is significant** – independently and inversely associated with risk of death from all causes and cancer after controlling for potential confounders, including CRF. The inverse association was consistent with age (<60 years and ≥ 60 years) and body mass index (18.5 – 24.9 and ≥25 kg/m²).
- **60% higher cardiovascular risk and higher mortality rate** – in men with low muscular strength.

- **Protective effect of muscular strength against mortality risk** – may be due to muscular strength in itself, to muscle fiber type or configuration or as a consequence of regular physical exercise, specifically resistance exercise. Muscle fiber type and configuration has a genetic component and influences strength, yet it is clear that resistance type physical activities are major determinants of muscular strength.
- **Resistance training may help reduce all cause mortality among men** – by promoting regular resistance training involving major muscle groups (lower and upper body) two or three days a week. Resistance training should complement—not replace—aerobic exercise.

What you can do. Start by talking to your doctor about creating a balanced workout plan, focused on both aerobic and resistance training. Resistance training includes weight machines, free weights/dumbbells, stretch tubing and swimming pool activities. Your own body weight can add resistance in exercises, such as standing squats, crunches or push-ups.

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The benefits of resistance training are many.

- **Reduced body fat and lowered cholesterol:** Weight training is the best way to burn fat; it's more effective for losing weight than aerobic activity because it burns calories while you're exercising and at rest (Cooper 1998).
- **Increased bone density:** A 1988 study from Washington University School of Medicine concluded weight-bearing exercise leads to significant increases in bone mineral content, which are maintained with continued training in older subjects (Dalsky et al).
- **Increased body strength:** Most people, regardless of their age, experience strength improvements in a matter of weeks.
- **Reduced injuries:** Muscle strength decreases stress on bones during impact exercises (such as walking, jogging and tennis) and improves dynamic balance to make a person less susceptible to falls and other mishaps (Nelson et al 1994).
- **Eased in performing daily tasks:** Resistance training can increase your biceps' strength to 40 pounds and enhance your stamina.
- **Emotional stability:** Exercise stimulates neurotransmitters create a postexercise euphoria or endorphin response, making you feel better and less stressed (Stewart et al 1998).
- **Reduced muscle atrophy:** Most people over age 20 lose one half to one pound of muscle mass each year, due to inactivity. Resistance training helps maintain, and even increase, lean muscle.
- **Improved body appearance:** Weight training can help you directly target and build shapely arms, legs, abdomen and more—adding lean muscle in the process.

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