



# e-quilibrium

- "electronic briefs on behavior and health"

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## Movement

It is well established that regular physical activity is beneficial for health. However, research to better understand this relationship continues.

One of the ways in which people can notice the effects of exercise is how their clothes fit. In this sense, exercise affects one's "jeans." Scientists are also gaining an understanding of how exercise affects one's genes. A process known as DNA methylation regulates gene expression and is known to play a role in the development of disease, including cancers. It has been long assumed that this process only occurred over long periods of time, but evidence has mounted that DNA methylation can be affected by shorter-term factors, including exercise.

Several Swedish investigators conducted an interesting study in which 23 young and relatively sedentary participants exercised only one leg (knee extensions) for a three month period (four 45-minute sessions per week). This protocol allowed each individual to be her/his own control (i.e., one unexercised leg), and also removed the effects of diet, lifestyle, and other environmental factors. Both before and after the three-month training period, muscle biopsies were obtained from both legs. Significant and beneficial DNA methylation changes were found in the exercised muscles compared to the unexercised muscles. The genes examined in the study are known to affect energy metabolism, insulin activity, and inflammation.

Other research is indicating that even small amounts of exercise are helpful, both among lean and overweight individuals. Investigators in the United Kingdom followed over 300,000 adults for more than 12 years, and found that activity equivalent to walking just 20 minutes per day lowered the risk for premature death, regardless of body mass index (BMI) or waist circumference. The key appears to be making the change from inactivity to some activity.

Relatedly, “sitting disease” is getting increased attention. Excessive time spent sitting has been associated with increased risk of death from numerous causes. Of particular note, protracted sitting comes with health risks even among persons who exercise regularly. Therefore, in addition to the Centers for Disease Control and Prevention (CDC) recommendation that persons get at least 150 minutes of aerobic exercise per week (e.g., brisk walking) and muscle-strengthening activities at least 2 days per week that involve all major muscle groups, standing up and/or walking at least several minutes every hour is increasingly advised by major health organizations.

Persons are commonly counseled to get a physician’s permission before making a significant increase in their physical activity. Given the health risks associated with being sedentary, it would seem that physician permission to be physically inactive is even more important!

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