

Did You Know?

"Some Interesting Findings Relating to Exercise"



Physical activity is the only component that has a substantial element of voluntary control.

Energy Expenditure

Energy Expenditure is the act or process of expending energy. This must be taken into consideration when trying to lose, gain, or maintain one's current weight.

There are three main components of energy expenditure: basal metabolism, thermogenesis, and physical activity.

- Basal metabolism can be defined as the minimal amount of energy required to maintain vital functions in an organism at complete rest. This is generally measured by the basal metabolic rate (BMR) in a fasting individual who is at rest in a warm and comfortable environment.
- Thermogenesis can be referred to as the generation or production of heat by physiological processes.
- Physical activity can be defined as any bodily movement by the muscles which results in an expenditure of energy.

Energy Intake

Energy intake, on the other hand, is entirely voluntary, except in clinical conditions.

Therefore, the modifiable aspects of the energy balance equation amount to just two variables:

- Physical activity
- Food intake



Intake refers to the calories from food. Output refers to the calories used during physical activity.

The Balancing Act

Inactivity and overeating appear to be the largest contributors to the obesity epidemic. When energy intake (energy in) and physical activity (energy burned) are at balance with one another, the body is at homeostasis. There is no weight loss and there is no weight gain—weight is simply maintained. This is the ideal situation, provided the individual is at a healthy weight.



Energy intake > Energy Expenditure = Weight gain

Energy intake < Energy Expenditure = Weight loss

Energy intake = Energy Expenditure = Weight maintenance

To lose weight, an energy imbalance with an energy deficit is required. This can be done through dieting, exercise, or a combination of both.

The Importance of Exercise

- Reduces the risk of heart disease, high blood pressure, osteoporosis, diabetes, and obesity
- Reduces both total blood cholesterol and triglycerides and increases high-density lipoproteins (HDL), known as the "good" cholesterol
- Reduces the risk of a second heart attack
- Reduces the risk of developing colon cancer
- Contributes to mental well-being and helps treat depression
- Helps relieve stress and anxiety
- Increases energy and endurance
- Helps maintain a normal weight by increasing metabolism (the rate at which you burn calories)
- Helps you to sleep better
- Keeps joints, tendons, and ligaments flexible so it's easier to move around
- Reduces some of the effects of aging
- Helps older adults become stronger and better able to move about without falling or becoming excessively fatigued

Physical Activity and Coronary Heart Disease

Inactivity is a major, underlying risk factor for coronary heart disease (CHD). In a study published in JAMA, men, who were initially unfit and became fit, were found to have a 52% lower age-adjusted risk of cardiovascular disease mortality than their peers who remained unfit. Regular physical activity has been shown to impact blood pressure in a beneficial way. One study found that for every 26.3 men who walked more than 20 minutes to work each day, one case of hypertension would be prevented. It is important to note that these acute effects on blood pressure lowering do not require vigorous efforts. They can be achieved at 40% of maximal capacity during exercise. Lastly, moderate to vigorous-intensity physical activity has been shown to positively effect blood lipids. Blood lipids play a major role in the development of atherosclerosis, which is the underlying cause of CHD. The most commonly observed changes include: increases in high density lipoprotein (HDL or "good") cholesterol, with reductions in total blood cholesterol, low-density lipoprotein cholesterol (LDL), and triglycerides.

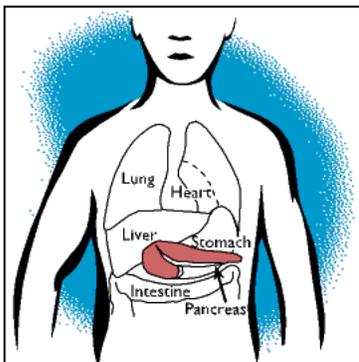


Physical Activity and Type 2 Diabetes

Physical activity is associated with:

- A reduced risk of type 2 diabetes
- Improved insulin sensitivity
- Glucose homeostasis

In a recent study, overweight subjects were able to reduce their risk of type 2 diabetes by 58% from participating in physical activity 30 minutes per day. The same holds true for normal-weight individuals, as physical inactivity has been shown to elevate the risk of developing type 2 diabetes in these individuals as well.



Physical Activity and Overweight/Obesity

Many studies emphasize the importance of combining exercise with dieting when attempting to lose weight. The research suggests that maximal weight loss is achievable when the two are combined. In a review of 11 studies, the average weight loss of the diet-only group was shown to be 6.7 kg; whereas, the average weight loss of the diet and exercise group was 8.5 kg.

Weight loss is not only achieved, but is also maintained through physical activity. In 3000 previously obese subjects, who reported a weight loss of 30 kg on average and maintained the loss for an average of 5.5 years, maintained the loss through an active lifestyle. Only 9% of the participants were able to maintain their weight loss in the absence of physical activity.

This clearly supports the importance of exercise in the prevention of weight regain.

Physical Activity and Appetite Control

Some people think that increasing physical activity increases hunger and food intake. Researchers have set out to examine this very idea. Both short-term (1-2 day) and medium-term (7-16 day) studies have demonstrated that men and women can tolerate substantial negative energy balances when they are physically active. This can result in weight loss.

Once around 30% of daily energy needs are expended in activity, food intake begins to increase. There are individual differences that are not well understood. This is an area currently under investigation.

However, relatively large energy imbalances can occur before the body compensates by increasing food intake.

Pennington Nutrition Series, Number 5, 2006

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Revised 10/07

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Physical Activity and Psychological Disorders

Physical activity is associated with elevations in mood and heightened psychological well-being. Inactive persons have been shown to be 1.5 times more likely to become depressed than those who maintain an active lifestyle. Physical activity is believed to protect against Alzheimer's disease. This is possibly due to increased blood flow, which may in turn promote nerve cell growth. It is believed that people who are intellectually and physically inactive have a 250% better risk of developing the disease.



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