

Physical Activity for Health

Fact Sheet No. **9.387**

Food and Nutrition Series | **Health**

by E. Gass, J. Haas, & L. Bellows*

Being physically active has many health benefits. Physical activity includes aerobic exercise, muscle strengthening, and flexibility training. Each type of activity contributes to overall health and wellbeing by providing distinct benefits.

Physical Activity Definitions

- **Physical activity:** Any bodily movement that results in energy expenditure.
- **Exercise:** A class of physical activity in which planned, structured, and repetitive movement is done with the goal of increasing or maintaining physical fitness.
- **Physical fitness:** A physiologic state of well-being that allows one to meet the demands of daily living or that provides the basis for sport performance, or both. Whole body fitness includes cardiorespiratory fitness, muscle strength, and flexibility. Participation in physical activity and exercise results in physical fitness.

Physical Activity Benefits

A number of positive outcomes are associated with being physically active. Maintaining a healthy weight and losing desired weight are two benefits of physical activity. Additionally, research has consistently shown a reduced rate of coronary artery disease in those who are more physically active, whereas low levels of physical activity may be associated with heart disease development, including coronary artery disease, and play a causal role in its progression. Physical activity has also been shown to decrease blood pressure and have a protective role in preventing type 2 diabetes.

Participation in regular physical activity can also reduce the risk for breast, colorectal, and pancreatic cancers.

Additionally, physical activity is useful in the prevention of osteoporosis with weight bearing and resistance exercise, specifically having the greatest effects on bone density. Weight bearing physical activity is necessary for appropriate skeletal development during childhood and adolescence and also for achieving and preserving peak bone mass in young adulthood. Some studies have found that long term, regular physical activity is associated with better cognitive function and less cognitive decline and dementia in older populations. Physical activity can also be effective in the treatment of anxiety and depression.

Physical Activity Guidelines

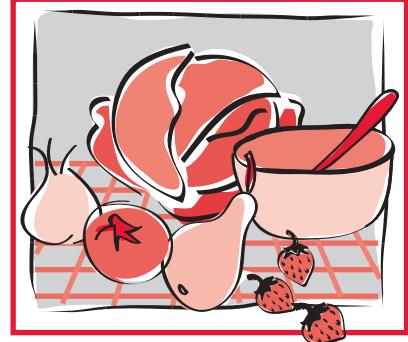
The U.S. physical activity guidelines present recommendations for three different classes of physical activity: aerobic activity, muscle strengthening, and flexibility training.

Aerobic Physical Activity Guidelines

Aerobic physical activity or aerobic exercise uses large muscle groups in repetitive movements that can be sustained for more than a few minutes. These physical activities target the cardiorespiratory system and result in improved efficiency and capacity of the cardiovascular system over time. The aerobic physical activity guidelines address several factors of activity participation including intensity, duration, and volume. It is also important to consider the frequency and regularity of aerobic activity participation.

• Intensity

Intensity can be thought of as the amount of effort it takes to perform an activity. The guidelines focus on two levels of intensity: **moderate intensity** and **vigorous intensity**. Moderate intensity activity results in an increased heart rate and causes sweating but should not



Quick Facts

- Healthy weight maintenance through physical activity and a healthy diet are important steps to reduce one's risk for chronic diseases such as heart disease and diabetes.
- The current U.S. physical activity guidelines state that adults should partake in 30 minutes or more at a moderate intensity on most—preferably all—days of the week. Physical activities that maintain or increase muscular strength or endurance should be performed at a moderate intensity on two nonconsecutive days per week.
- All major muscle groups should be stretched to the point of mild tightness with slight discomfort within the range of motion on two or more days per week.

*E. Gass, Colorado State University, former graduate student; J. Haas, Colorado State University Extension specialist, and research associate; L. Bellows, Extension food and nutrition specialist, and assistant professor.
8/2014



result in the inability to talk. Brisk walking, biking for pleasure, or general home and garden care are examples of moderate intensity activities. Vigorous intensity activity causes an even greater increase in heart rate, sweating, and the inability to talk for more than just a few words, without having to pause to take a breath. Jogging, swimming laps, and hiking uphill are all examples of vigorous intensity activities. To meet the guidelines, it is recommended that adults do at least moderate intensity activity or vigorous intensity activity, or a combination of both. Vigorous intensity activity can be done for less time than moderate intensity activity and have the same benefits. See Table 1 below for more examples of moderate and vigorous intensity activities.

How to Calculate Heart Rate at Moderate Intensity

Moderate intensity corresponds to 50-70% of maximal heart rate. Appropriate heart rate at moderate intensity can be calculated using the following equation:

$$(220 - \text{age}) \times .50 = \text{appropriate heart rate at moderate intensity}$$

For example, if an individual is 45 years old, their appropriate heart rate at moderate intensity is about 88 beats per minute.

$$(220 - 45) \times .50 =$$

$$175 \times .50 = 88 \text{ beats per minute}$$

The Borg Rating of Perceived Exertion (RPE) scale is one way of measuring physical activity intensity level. See Figure 1. The scale ranges from 6 (no exertion at all) to 20 (maximal exertion). Moderate intensity activity falls at 12-14 on this scale and the person should feel as if they are working ‘somewhat hard’.

- **Duration**

The guidelines suggest at least 30 minutes per day of physical activity. However, all 30 minutes of activity do not have to be performed at once. Instead, benefits can be received by

doing the activity in three smaller sessions of 10 minutes each, just as long as 30 minutes of activity are accumulated over the course of the day.

- **Volume**

Volume refers to the total amount of physical activity accumulated over a specific time span, usually one week. The guidelines suggest a range of 150-300 minutes per week, or 30 minutes on most days, of moderate intensity activity. As the intensity of exercise increases the volume required for benefits decreases. Thus, 75 minutes per week of vigorous intensity physical activity is also appropriate in meeting the recommendations as is 150 minutes of moderate intensity physical activity. Some activity is better than none, and substantial health benefits can be obtained with small increases in physical activity volume. Also, accumulating more than the physical activity volume recommendation will result in greater health benefits and increased fitness.

- **Frequency and Regularity**

Physical activity should be performed on three or more days per week on a regular basis in order to receive the most health benefits. By continuing to engage in physical activity regularly, one is more likely to make physical activity a part of their everyday lifestyle.

Muscle Strengthening Activity Guidelines

Muscle strengthening activity, in addition to aerobic physical activity, is also important for health. The guidelines recommend that individuals engage in physical activities that maintain or increase muscular strength and endurance on 2 or more days per week. Adults should aim for exercises that target all major muscle groups: the legs, hips, back, abdomen, chest, shoulders, and arms. These exercises should not be done on back-to-back days and should be performed at moderate intensity. Examples of muscle strengthening activities include weight training, weight bearing calisthenics that use body weight for resistance (such as push-ups), and resistance band exercises. A weight or resistance that allows for the

Figure 1. Borg Rating of Perceived Exertion Scale.

6	No Exertion
7	
8	
9	Very Light
10	
11	Light
12	
13	Somewhat Hard
14	
15	Hard
16	
17	Very Hard
18	
19	
20	Maximal Exertion

completion of 10-15 repetitions per set should be used, and, if possible, 2-3 sets should be done for most benefit.

Flexibility Training Guidelines

The third class of physical activity guidelines is flexibility training. Flexibility training recommendations state that all major muscle groups should be stretched to the point of mild tightness with slight discomfort within the range of motion on two or more days per week. Stretches should be held for 10-30 seconds and 2-4 repetitions should be done per muscle group in order to accumulate 60 seconds per stretch. It is preferable for these stretches to be performed on the same days as muscle strengthening activities. Static, dynamic, and ballistic stretches are all acceptable in meeting the flexibility training recommendations. Static stretching should be performed after completing physical activity, and dynamic and ballistic stretching can be used prior to physical activity, as a warm-up.

- **Static stretching** involves stretching a muscle or group of muscles to its farthest point and then holding that position.
- **Dynamic stretching** involves moving parts of your body and gradually increasing reach, speed of movement, or both. Dynamic stretching consists of controlled, gentle leg and arm swings within the limits of range of motion.
- **Ballistic stretching** involves using the momentum of a moving body or a limb in an attempt to force it beyond its normal range of motion.

Strategies for Meeting the Guidelines

- Start by engaging in physical activity in short bouts of 10 minutes, 3 times throughout the course of the day.
- Wake up 30 minutes earlier a few days per week to perform the physical activity.
- Park farther away from the desired destination and walk the extra distance.
- Drive less frequently and walk or bike instead.
- Replace regular sedentary activities such as watching TV with a more physically active alternative such as walking.
- Do stretches, exercises, or pedal a stationary bike while watching television or during commercials.
- Join a walking group.
- Recruit a partner for support and encouragement.
- Get the whole family involved by being active together.
- Put on some music and dance!

Summary

In order to accumulate the full range of benefits associated with physical activity it is important to strive to meet the physical activity guidelines for Americans. These recommendations state that aerobic physical activity should be performed for 30 minutes or more at a moderate intensity on most, preferably all, days of the week. Additionally, the guidelines include performing physical activities that maintain or increase muscular strength and endurance on 2 or more days per week. Lastly, all major muscle groups should be stretched to the point of mild tightness with mild discomfort on 2 or more days per week.

Table 1. Examples of moderate- and vigorous-intensity activity for healthy adults.

Moderate Intensity Activities	Vigorous Intensity Activities
Walking briskly	Jogging
Biking 10 miles per hour or slower	Biking faster than 10 miles per hour
Tennis (Doubles)	Tennis (Singles)
Water Aerobics	Swimming Laps
Mowing Lawn	Hiking uphill with a backpack
Heavy Cleaning	Shoveling

Resources

- www.cdc.gov/physicalactivity/everyone/guidelines/index.html
- www.cdc.gov/physicalactivity/
- www.choosemyplate.gov/physical-activity/increase-physical-activity.html

References

- Pate RR, Pratt M, Blair SN, Haskell WL, Macera CA, Bouchard C, Buchner D, Ettinger W, Heath GW, King AC, et al. (1995). Physical activity and public health. A recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *The Journal of the American Medical Association* 273, 402-407.
- Warburton DR, Nicol CW, Bredin SD. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal* 174, 801-809.
- Paluska SA, Schwenk TL (2000). Physical activity and mental health: current concepts. *Sports Medicine*. 29, 167-180.
- Powell KE, Blair SE. (2011). Physical Activity for Health: What Kind? How Much? How Intense? On Top of What? *Annual Review of Public Health* 32, 349-365.

Nelson ME, Rejeski WJ, Blair SN, Duncan PW, Judge JO, King AC, Macera CA, Castaneda- Sceppa C. (2007). American College of Sports Medicine and American Heart Association. Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association. *Circulation* 116, 1094-1105.

American Council on Exercise. (2010). ACE Personal Trainer Manual 4th Edition.