



The Benefits of Physical Activity Following a High-Fat Meal

By Laura LaDue, Health Psychology Doctoral Student

Researchers at the University of Indiana at Bloomington have completed a study showing that exercise after a high-fat meal can actually reverse the damaging effects on the arteries created by such a meal. After eating meals that are high in fats, the arteries are unable to expand in size to enable increased blood flow. As a result, less blood is able to get to the bodily tissues. This effect, over time, can lead to clogged arteries, known as atherosclerotic heart disease (see below). After a fatty meal, a healthy person's arteries look similar to the arteries of a person with heart disease. The fat and cholesterol floats through the blood vessels causing blood flow to slow down. This is similar to a traffic jam on the highway. The road is fine, but the cars are stuck because traffic is piled up. The fat and cholesterol fill up the space that is designed for blood flow. Too much of these substances in the bloodstream narrows the amount of space where the blood can pass through. After a meal, this condition will last for several hours, peaking five to six hours later. Once the body begins to recover, it is then time for another meal and the process starts over again.

Atherosclerotic heart disease (frequently called 'hardening of the arteries') is the leading cause of illness and death in America. In atherosclerosis, the arteries become filled with plaque, which clogs the arteries, resulting in decreased blood flow to the tissues in the body. The plaque is made up of fats and cholesterol. If meals consist of mostly fat and cholesterol, they tend to build up over time. This can eventually lead to heart attacks and stroke, as the narrowed blood vessels can no longer supply needed blood to the body's tissues.

In the University of Indiana at Bloomington study, eight apparently healthy adults (average age was 25 years old) ate either a low-fat meal or a high-fat meal. Two hours after eating the high-fat meal, the participants performed aerobic exercise consisting of walking on a treadmill for 45 minutes at a speed of 2½ - 5 miles per hour. Incline and speed were gradually increased until each participant was walking at peak effort. Blood flow was monitored throughout the exercise. The results of the study showed that those who had eaten a high-fat meal and also exercised or ate a low-fat meal with no exercise had better functioning arteries than those who ate a high-fat meal and didn't exercise. Furthermore, those who exercised after the high-fat meal had even better functioning arteries than those who ate a low-fat meal and did not exercise. The participants who ate a low-fat meal were not asked to exercise in this study.

Both the high-fat and low-fat meals (breakfast) had approximately the same number of calories. The difference, however, was in the amount of fat and sodium in each of the meals. The high-fat meal consisted of an Egg McMuffin, a Sausage McMuffin, two hash brown patties (McDonald's Corporation) and a

glass of water. Total number of calories was 940 with 48 grams of total fat, 16.5 grams of saturated fat, 4.5 grams of trans fat, 280mg of cholesterol, 91 grams of carbohydrates, 33 grams of protein and 2,220mg of sodium. The low-fat meal consisted of approximate 5 ounces of Frosted Flakes (Kellogg Company), with 8 ounces of skim milk and 16 ounces of orange juice. Total calories were 945 with 0 grams of fat, 0 grams of saturated fat, 0 grams of trans fat, 5mg of cholesterol, 209 grams of carbohydrates, 23 grams of protein and 959mg of sodium.

The significance of this study demonstrates the importance of exercise on heart health. It appears that exercise has a protective component to the heart and blood vessels. While it may be beneficial to exercise after a fatty meal, it is still important to remember that eating meals that are low in fat and cholesterol is the best way to prevent heart disease and stroke. However, the occasional fatty meal might be counteracted by aerobic exercise. When eating a low-fat diet, the benefits of exercise will be even better. Less fat to remove from the system causes less stress on the heart and blood vessels.

There are some important limitations to this study. The first is the low number of participants. This study had only eight participants: five men and three women. Further studies would need to be done to see if this effect would carry over to a larger population. The second limitation is that it was done on young, apparently healthy adults. Further studies on older adults and those who already have heart disease would also need to be done. The authors defined "apparently healthy" as those people with no history of high blood pressure, diabetes or tobacco use. The participants did not have evidence of heart or lung problems, gallbladder disease, difficulty exercising or problems with their blood vessels. In addition, the blood vessels of older adults may respond differently than those of the participants in the study. Timing of exercise or the type of exercise may be important when looking at the effects of exercise on the blood vessels of older adults.

As with any exercise program, it is important to check with your healthcare provider before beginning a walking program after meals. Having a full check-up prior to starting any exercise program is advisable. Also, eating foods that are low in fat and cholesterol are important to heart health. The effects of long-term ingestion of fats and cholesterol have shown to be detrimental to the heart and blood vessels. Your healthcare provider may recommend having periodic blood cholesterol checks to be sure you are in a safe range for heart health. The American Heart Association has guidelines for the daily allowance of fat and cholesterol.

Also important is the way you approach exercise. It is important to begin slowly at a comfortable pace and work up to a more strenuous pace. Begin by walking 30 minutes a day for 3 days a week. Gradually build up to 45 minutes. When you are able to complete your walk without feeling exhausted, you may increase your speed. Be sure to wear good walking shoes and dress for the weather. Also, watch for cars, bicycles or other exercisers when out. Be sure to wear reflective clothing if you are exercising at dusk or in the evening. Be sure to walk with a buddy not only for safety purposes, but also for support and encouragement. When the weather is bad, find a place indoors to walk such as the mall.

For more information on healthy eating and exercise programs that might be right for you, contact Lincoln Area Agency on Aging Lifetime Health Program at 441-7575.

Reference: Padilla, J., Harris, R.A., Fly, A.D., Rink, L.D., & Wallace, J.P. (2006). The effect of acute exercise on endothelial function following a high-fat meal. *European Journal of Applied Physiology*, 98(3), 256-262.



LINCOLN IN MOTION

**Get Moving!
Get Healthy!**

Regular physical activity helps to prevent illness and improves the overall quality of life. That is why Lincoln's Physical Activity Council is working to get *LINCOLN IN MOTION!*

LINCOLN IN MOTION can help you achieve a healthier lifestyle. Check out our website for more information on our vision statement, *LINCOLN IN MOTION* partners, sponsorship opportunities, promotional tools, and a schedule of events.

www.lincolninmotion.org