CENTRAL OHIO
PRIMARY CARE

Upper Arlington
Preventative Primary Care

Sitting Is The New Smoking

Steven T. Devor, Ph.D., FACSM
Exercise Physiology, Upper Arlington Preventative Primary Care

Many of us as healthy active individuals, who exercise most days of the week, believe that being physically inactive is something we need not worry about. However a large amount of important and recent research focused on the daily overall amount of non-exercise physical activity, (i.e., time spent simply moving around), indicates those who exercise also sit for several hours during the day after their workouts.

In fact we now know that on the day of a workout for a consistent exerciser there are often less overall minutes of accumulated physical activity than on a day when no formal structured exercise is completed. In other words, we tend to have less *overall* physical activity on days that we workout than on days we do not workout. Simply put, in society today we sit more than any previous generation, and research indicates that on average adults spend more than nine of their waking hours per day in sedentary activities.

Recently, scientists with the National Cancer Institute followed approximately 250,000 adults in America for eight years. All of the study subjects were required to answer detailed surveys to understand how much time they spent each day commuting in a car or bus, watching television, sitting before a computer, and doing daily structured exercise. Questions were also asked to understand the state of their general health and well being. At the start of the study none of the subjects suffered from heart disease, any type of cancer, or diabetes.

To the surprise of the investigators, at the conclusion of the eight year study many of the participants were sick and a number had died. Interestingly the sick and those that had died were almost always very sedentary. Further, those who indicated they viewed television for greater than seven hours a day were at a much higher risk of premature death compared with the subjects who sat sedentary viewing less television.

Perhaps most important for those of us that exercise or run daily, is the research clearly indicated the daily routine of going to the gym or running only slightly lowered the negative health risks that are highly associated with hours of daily sitting. Indeed, those who reported doing structured exercise for seven hours or more a week (an average of 60 minutes every day), but that also spent at least seven hours a day in front of the television or computer, were more likely to die

prematurely than those who exercised seven hours per week but watched less than an hour of television per day.

I want to be clear. It is very possible to have a high level of structured physical activity, for example running for 60 minutes per day, but still spend most of your daily waking hours sitting. You sit during your commute to work. You sit in front of your computer. You sit in meetings. You sit eating meals. You sit and watch television. You sit at the movie theatre. You sit playing video games on your game console or smart phone. You sit reading.

From an overall day long physical activity perspective, it is very possible to get in your structured workout, yet still be highly sedentary; what I refer to as an "active couch potato" Increasingly large amounts of carefully done research indicate that while consistent daily

structured exercise is clearly beneficial to your health, it does not fully counteract the highly negative effects of sitting. In my opinion, too much daily sitting is the new smoking.

A recent research publication from Australia utilized a powerful statistical analysis to determine that every hour an individual spends sitting still watching television, will subtract approximately 22 minutes from their life. Considered over an entire lifetime, this would mean that if a man with an average life span never viewed television, he would live approximately 2.0 additional years, and a woman that watched no television might live approximately 2.2 years longer.

Another recent study investigated how sitting can influence both glucose and insulin levels in the blood. The study required 19 adult subjects to do one of three things for seven hours on three separate days. On day one the subjects were required to sit completely still for the entire seven hours. On day two the subjects had to rise from their chairs once every twenty minutes and walk slowly on a treadmill for two minutes. Finally, on day three the subjects had to get up from their chairs every twenty minutes and run slowly during their two-minute intervals.

When the subjects remained seated for the entire seven hours, their blood glucose and insulin both spiked well above normal levels. However, when the sitting hours were interrupted every twenty minutes with movement their blood glucose and insulin levels remained normal.

Importantly, neither walking nor running was more effective with regard to lowering blood glucose and insulin. What was critical was simply breaking up the long sustained hours of sitting. Additionally, and important for those interested in weight loss or maintenance of weight loss, on the days when the subjects walked or ran for the two minute intervals they burned hundreds of additional calories over the seven hour period.

So what exactly causes prolonged sitting or sedentary behavior to be so detrimental to our health? Research is providing an increasingly clear picture that all of the sitting we do decreases blood circulation in our skeletal muscles, and at a cellular level our bodies begin to decrease metabolic activity. One very important enzyme in particular, lipoprotein lipase, has been clearly shown to decrease activity during prolonged periods of sitting. Lipoprotein lipase is responsible for the breakdown of fat, and if its activity is lower in your skeletal muscles fat is either stored or pushed into the bloodstream rather than being broken down for use as a fuel.

Studies done in both rats and humans reveal that lipoprotein lipase activity is significantly lower in rats when they are prevented from moving as they typically would in their cages, and in humans when they are required to sit for more than 30 minutes. Inactive animals and humans demonstrate evidence of both insulin resistance and higher levels of fat in their blood. Increased fat levels in the blood are the result of the low activity of lipoprotein lipase associated with inactivity. Lipoprotein lipase activity is only heightened when we are standing, moving around, or active.

Although this important line of research is eye opening, there are easy remedies for this problem. As an active couch potato, it is as easy as moving around more, or even simply standing once every 30 minutes. The simple act of rising from your chair once every 30 minutes will keep the activity of lipoprotein lipase heightened in your skeletal muscles.

My advice is to set a reminder on your computer screen to go off every 30 minutes, and then stand up and move around your office or home. Or at least simply stand and stretch for 15 seconds. It is important that we all become significantly more conscious about how we spend our non-formal exercise time. In my opinion everyone should actively seek opportunities to reduce daily sitting time and move more often over the course of the day.

Finally, I believe it is worth noting that one of our nations greatest thinkers and inventors (and native Ohioan), Thomas Edison, firmly believed that great ideas and thoughts originate in the muscles. And he was convinced that his greatest ideas came to him when he was active. A true mind body connection, something to consider.