



# What the Body Wants: The Importance of the Full Range of Movement



Adapted from a drawing by Bill Stumpf

*The human body was built to move, and for the first six million years, humans either did just that (quickly and often) or didn't survive. Even 150 years ago when society was agrarian, people spent their days moving from one chore to the next. Activity wasn't built into life; it was life. Then came the Industrial Revolution and technology and high technology.*

*In 1950, almost 50 percent of Americans worked in white collar jobs; by 2000, almost 75 percent did.<sup>1</sup> In just a few generations, work has become something done from a chair for millions of people. The result? We need to be intentional about putting movement back into work.*

## What We Know

Sitting all day at work isn't ideal for the body. The low physical workload that comes with sitting can put you at risk for back pain. Sitting down causes the pelvis to roll rearward. That changes the lumbar into kyphosis—the discs are compressed rearward, as well. It also stretches large muscle groups in the back and legs, increasing muscle activity.

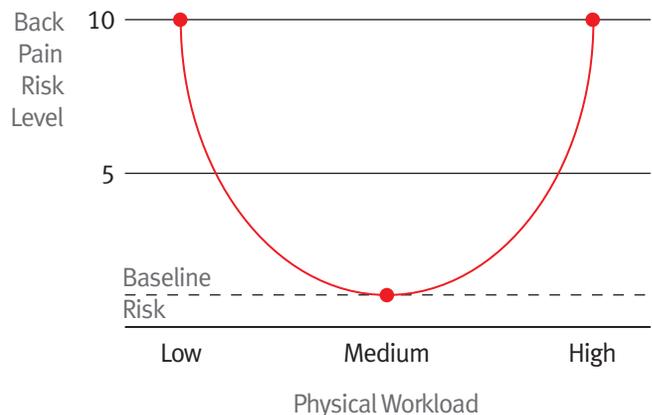
Furthermore, sitting for long periods of time actually changes the way your body works. Everyone knows that sitting uses less energy than almost any other activity—46 calories an hour compared to 180 calories per hour for cooking.<sup>2</sup> It slows metabolism, which can lead to weight gain that, in turn, brings on a host of other health-related issues.

In addition, researchers are finding that sitting also causes a drop in healthy cholesterol. That's because even light activity (standing while talking on the phone, for example), activates enzymes. One enzyme, lipoprotein lipase, collects fat and cholesterol from the blood and turns the fat into energy while shifting the cholesterol from LDL (bad) to HDL (good). Relax in your office chair and those enzymes relax, too, allowing fat to stay in the bloodstream. Within a few hours, healthy cholesterol drops by 20 percent.

A study that followed 17,000 Canadians, age 18–90, for 12 years showed that “daily time spent sitting was associated with an elevated risk of all-cause and cardiovascular disease mortality... independent of leisure time physical activity levels and BMI.”<sup>3</sup> If you run four miles every morning but sit most of the rest of the day, you're still at increased risk for heart disease, obesity, diabetes, and some cancers.

Some experts are going so far as to say that sitting is a public health risk and that there need to be guidelines for daily sitting just as there are guidelines for daily exercise. “Sitting too much is not the same thing as exercising too little,” says University of Missouri microbiologist Marc Hamilton. “They do completely different things to the body.”<sup>4</sup>

Standing in one place all day isn't good for the body either; it places a high workload on the body that puts it as just as much risk for back pain as the low workload of sitting. Using a workstation that's a combination of treadmill and work surface is one approach to integrating movement into the day. While it may solve one problem, it introduces new ones. Using a treadmill desk may also cause eyestrain: the movement involved in walking forces the eye to continually refocus on the monitor. This strain causes rapid eye fatigue, making it difficult to work this way for very long. Many people are already familiar with this fatigue, albeit at the gym. The effort required to focus on reading a book while working out means that most people choose to watch TV instead, because they find it less taxing on their eyes.



A physical workload that's too low (sitting all day) or too high (standing all day) increases the risk of back pain. Ergonomists recommend standing about five minutes out of every hour.<sup>5</sup>

Furthermore, walking and mousing or keyboarding are competing activities. Walking requires using the major muscle groups in our legs and back, while keyboarding and mousing require using the small muscles in our hands.

## Therefore

It's best to alternate sitting and standing throughout the day. This reduces the chance of back pain and improves circulation.

## Design Problem

The design problem is largely societal. While the body thrives on movement and variety of position, the work we do today doesn't require much of our bodies. It's all brain work. And while movement does improve creativity and concentration, workers who have the freedom to get up regularly don't take advantage of it. It seems we persist in equating productivity with sitting at our desk for hours at a time, or we worry that co-workers will think we're slacking off. Even standing up in the middle of a meeting to stretch is considered a sign of disinterest, rather than an effort to rejuvenate. Workers who are tethered to their desks and allowed only a few short breaks at scheduled times, e.g., call center employees, have it particularly hard.

While the implications of continuous sitting are clear and many companies are well versed in ergonomics, this particular issue is only beginning to make it onto organizational radar screens. Conditions related to sitting for too long affect worker health, productivity, and the bottom line. Back pain just in 40- to 65-year-old workers costs employers an estimated \$7.4 billion/year, according to the Journal of American Medical Association.<sup>6</sup>

## Design Solutions

The solution is to provide a way for workers to sit and stand and move throughout their day. One way of doing this is through the furniture itself. Herman Miller has always believed in the importance of furniture that supports a variety of positions and encourages movement. In the 1960s, before the term ergonomics was widely known, intuitive designers like George Nelson designed a stand-up, roll-top desk for the Action Office® line, and Robert Propst designed a "perch," which was a cross between a stool and a chair. Because they themselves stood for part of their work day, these designers knew the benefits of standing, and their designs reflect that. Today, Herman Miller has a selection of tables and desks that give you many postural options as you work and are height-adjustable (Everywhere™ and Envelop® tables).

The second way to get movement into the day is build it into the workplace through the placement of shared equipment and common

spaces. Create a layout that forces workers to take a longer route to their destination. Not only will it be good for their backs and circulation, but it will also increase the opportunity for chance encounters and serendipitous conversations.

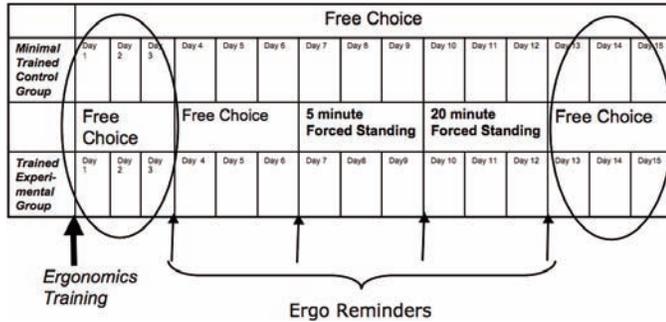
If your workstation doesn't allow for a sit-to-stand surface or you're not walking regularly to the printer or to meetings, stand up at least once an hour and walk around for five minutes. This simple activity will refresh all your major and minor muscle groups. And if you must sit all day, a good work chair can help by supporting your lower back, allowing for a variety of positions and providing cushioning in those areas where your soft tissues are most sensitive to pressure.

Creating awareness of why a combination of sitting and standing is important is only the first step. Research shows that even people who know about ergonomics don't put their knowledge into action unless they are shown how to use adjustment features on furniture and seating *and* reminded to use them.

Recent research has shown a strong correlation between training and actually using the standing posture in workstations that are equipped with sit/stand capability.<sup>7</sup> It seems that simply telling an employee that the work surface can go up and down doesn't provide enough incentive for the employee to try standing some of the time. However, for those who were told of the physiological importance of standing part of the time and then strongly encouraged to practice standing, it became a regular part of their work day.

A closer look at the research shows why training employees who spend much of their work day at the computer and following up with them is a smart investment for companies that are committed to a healthy work place. The research was conducted to study the effects of ergonomic training and adjustable workspace design on things like musculoskeletal discomfort and performance. During the first four days of the 19-day experiment, a control group of participants received standard instruction about the work setting and received the manufacturer's pamphlet that gave instructions on chair adjustment. A second group of participants heard a 1.5-hour instructional session that included case studies and hands-on practice periods.

## STUDY DESIGN: RANDOMIZED CONTROL TRIAL



During the study, there were some days when workers had to stand periodically and some days when they could choose not to.

In the days following, both groups were subjected to the same rules. On some days, they were forced to stand for five minutes; on other days, they had to stand for 20 minutes. There were also “free choice” days on which standing for part of the time was completely up to them. Throughout the study, which lasted 19 days, both groups also received reminders throughout the day to stand up (beyond the forced standing period), except on the free choice days.

The control group did not stand at all during the experiment, even after receiving reminders. The trained group stood 30 minutes on the free choice days before they started receiving reminders on the other days and 60 minutes on the free choice days after receiving the reminders on the other days.

The results of the study show why organizations and individuals should change the way they think about taking breaks and introducing more postural variety into their days at the office. The control group reported more than four times as many musculoskeletal symptoms as the trained group, which on some days had zero symptoms.

In addition, performance accuracy was significantly higher for the trained group, and they reported a greater sense of control over the work environment because they were able to apply what they knew about the importance of sitting and standing throughout the day. Studies have long shown that control over environmental factors (e.g., being able to make yourself comfortable by adjusting heat, light, and noise) lowers stress and increases productivity.

While making yourself comfortable through movement is not typically included as a factor, perhaps it should be. As Nelson and Propst suspected early on, what's good for the individual body is good for the collective body, as well.

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