



**The Truth About**

# Sitting And Your Health

*"Sitting all day is the worst thing in the world you can do for your back."*

– Dr. Joel Press  
Medical Director  
Spine & Sports Institute  
Rehabilitation Institute of Chicago

## The Unhealthy Effects of Sitting on The Human Body

### ► Brain

The brain is highly energetic organ that requires a constant supply of blood, oxygen, and glucose. There is a direct link between exercising your muscles and supplying your brain with what it needs. Conversely, a lack of physical activity deprives your brain of blood and nutrients, which causes you to have difficulties in cognitive processing (thinking).<sup>1</sup>

### ► Neck, Back, and Spine

Sitting for prolonged periods is a risk factor for neck pain, presumably because the neck is held in a constantly flexed (bent) position.<sup>2</sup> This soreness extends to the shoulders and upper back, as well.<sup>3</sup> Sitting with the back slouched for as little as 20 minutes can result in increased laxity of spinal ligaments, and it can take 30 minutes or more for these ligaments to regain their previous level of stiffness, which allows spinal discs to “creep.”<sup>4</sup>

This increased laxity or looseness makes it more difficult for the muscles of the lower back control the spine and reduces the amount of weight that the spine can support.<sup>5</sup> In other words, prolonged sitting makes the back weak and leads to lower back pain. Conversely, periodic standing sessions of 20 minutes seem to reduce fatigue and low back pain symptoms. Prolonged sitting can actually change the anatomy of the human spine, decreasing the distance between vertebral bones, compressing intervertebral discs, and predisposing the back to injury.<sup>6</sup>

## ▶ Heart

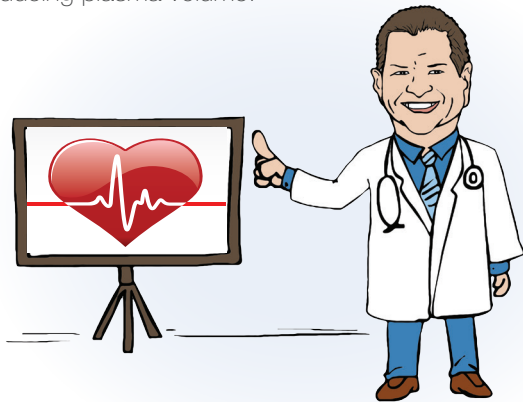
Prolonged sitting is risk factor for cardiovascular disease.<sup>7</sup> In fact, sitting is a risk factor that is independent of cardiovascular fitness. This means even in people who are physically fit but who sit for prolonged periods (i.e. greater than 20 min.), are at increased risk for heart disease. Prolonged sitting increases blood pressure,<sup>8</sup> just as increased activity decreases it. Sitting time correlates with cardiovascular disease mortality risk.<sup>9</sup> In other words, the longer a person spends sitting, the higher his or her risk is of dying from cardiovascular disease.

## ▶ Pancreas

Muscles at rest for long periods (like during sitting) become less sensitive to the effects of insulin. As a result, the pancreas increases its production of insulin to try to overcome this resistance. Over time, this increases the risk for type 2 diabetes.<sup>10</sup> In fact, people considered to live a sedentary lifestyle nearly doubled their risk of developing diabetes compared to active individuals.<sup>11</sup> Sadly, the definition of “sedentary” used in this study could apply to many Americans who have “desk jobs” or who watch television while seated for more than an hour a day.

## ▶ Legs and Feet

Unlike arteries, veins contain very little muscle. Veins require muscle activity to squeeze the blood back to the heart. When someone is seated for an extended period time, blood tends to pool in the veins of the leg. This blood pooling greatly increases the risk of creating blood clots called deep vein thrombosis.<sup>12,13</sup> Uninterrupted sitting increases factors within the blood that cause blood clots (i.e., fibrinogen) and makes the blood thicker, by reducing plasma volume.<sup>14</sup>



## ▶ The Entire Body

Essentially this means that prolonged sitting can shorten your life and increase your risk of several chronic diseases. What is more, even if you exercise as recommended and then sit for prolonged periods, you are still at increased risk of these diseases.<sup>8</sup>

- **Depression** – Lack of physical activity can increase the risk of depression and depressive symptoms.<sup>15</sup> Increasing depression leads to apathy and a lack of motivation, making it more difficult to get moving. When prolonged sitting leads to depression, it becomes a vicious, downward spiral.
- **Diabetes** – Prolonged sitting doubles the risk of developing type 2 diabetes. When the muscles go unused, they are less able to sense insulin. This means less glucose enters cells and more glucose stays in the blood, which is the definition of diabetes mellitus.
- **Cancer** – Sitting is even linked to increased cancer risk. The risk of colon cancer increases by 8% and endometrial cancer risk increases by 10% for every 2 hours of sitting.<sup>16</sup> In other words, people who sit while watching television for 4 hours a day have an 8 and 10% increased risk of colon and endometrial cancer, respectively, than people who sit watching television for 2 hours a day. Sitting also increases the risk of lung cancer.<sup>16</sup>

*"People who don't exercise can be healthier even if all they do is reduce the amount of time they sit. People who do exercise can be healthier by decreasing the time they spend sitting, too. What we are really talking about is a change in the fundamental way that we do things in society by reducing sedentary time. We've known an active lifestyle is better for a long time."*

– Jason Matuszak, M.D,  
Sports Medicine specialist



# A Simple Solution To The 20-Minute Rule:

Stand4HealthApp

## The Stand4HealthApp

**Let's not overcomplicate this** – if sitting too long is harmful, then you need to move more often! For those who are in a chair all day at work, I have designed a simple reminder app called **Stand4HealthApp**, which is available at the I-tunes AppStore and for download on Android devices. When you sit down at your workstation, just set the **Stand4HealthApp**, and you will be reminded to get up and move a bit every 20-minutes.



*“Sitting time is associated with a higher risk of all causes of mortality: heart disease mortality, cancer mortality, and diabetes — independent of exercise.”*

– David Alter, M.D., Ph.D.,  
Senior Scientist  
Toronto Rehabilitation Institute  
Institute for Clinical Evaluative Sciences



### About Dr. Douglas J. Taber

Dr. Douglas Taber is the award winning author of several books, including: *The Back Pain Solution: Unlocking the Spinal Code*, *The Spinal Answer Exercise Program*, *Spinal Decompression & Stabilization Protocol*, *Overcoming Failed Back Surgery*, *Spinal Stabilization: A Functional Rehab Program*, *The Neck Pain Solution: A Guided Healing Approach*, and *Here: Mind-Body Harmony Through Present Moment Awareness*. His audio releases include *Guided Meditations*, *Presence*, *Mindful Eating*, and *Morning & Evening Affirmations*, which are available as MP3 downloads on iTunes and amazon.com. Dr. Taber's upcoming book, *Success Today*, which he is co-authoring with Brian Tracy, is scheduled for release this summer.

His latest release, **Stand4HealthApp**, is a downloadable timer for sedentary people and desk workers to remind them periodically to get out of their chairs and move as part of adapting a healthy lifestyle. The app is available for the Android and at the I-tunes AppStore

### References

1. Steinberg SI, Sammel MD, Harel BT, et al. Exercise, Sedentary Pastimes, and Cognitive Performance in Healthy Older Adults. *Am J Alzheimers Dis Other Demen*. Aug 5 2014. doi:10.1177/1533317514545615
2. Ariens GA, Bongers PM, Douwes M, et al. Are neck flexion, neck rotation, and sitting at work risk factors for neck pain? Results of a prospective cohort study. *Occup Environ Med*. Mar 2001;58(3):200-207.
3. Straker LM, O'Sullivan PB, Smith AJ, Perry MC. Relationships between prolonged neck/shoulder pain and sitting spinal posture in male and female adolescents. *Man Ther*. Jun 2009;14(3):321-329. doi:10.1016/j.math.2008.04.004
4. McGill SM, Brown S. Creep response of the lumbar spine to prolonged full flexion. *Clin Biomech (Bristol, Avon)*. Feb 1992;7(1):43-46. doi:10.1016/0268-0033(92)90007-q
5. Howarth SJ, Glisic D, Lee JG, Beach TA. Does prolonged seated deskwork alter the lumbar flexion relaxation phenomenon? *J Electromyogr Kinesiol*. Jun 2013;23(3):587-593. doi:10.1016/j.jelekin.2013.01.004
6. Billy GG, Lemieux SK, Chow MX. Changes in lumbar disk morphology associated with prolonged sitting assessed by magnetic resonance imaging. *PM R*. Sep 2014;6(9):790-795. doi:10.1016/j.pmrj.2014.02.014
7. Dunstan DW, Thorp AA, Healy GN. Prolonged sitting: is it a distinct coronary heart disease risk factor? *Curr Opin Cardiol*. Sep 2011;26(5):412-419. doi:10.1097/HCO.0b013e3283496605
8. Thorp AA, Owen N, Neuhaus M, Dunstan DW. Sedentary behaviors and subsequent health outcomes in adults: a systematic review of longitudinal studies, 1996-2011. *Am J Prev Med*. Aug 2011;41(2):207-215. doi:10.1016/j.amepre.2011.05.004
9. Shiyovich A, Shlyakhover V, Katz A. [Sitting and cardiovascular morbidity and mortality]. *Harefuah*. Jan 2013;152(1):43-48, 58, 57.
10. Aravindalochanan V, Kumpatla S, Rengarajan M, Rajan R, Viswanathan V. Risk of diabetes in subjects with sedentary profession and the synergistic effect of positive family history of diabetes. *Diabetes Technol Ther*. Jan 2014;16(1):26-32. doi:10.1089/dia.2013.0140
11. Biswas A, Oh PI, Faulkner GE, et al. Sedentary Time and Its Association With Risk for Disease Incidence, Mortality, and Hospitalization in Adults: A Systematic Review and Meta-analysis. *Ann Intern Med*. Jan 20 2015;162(2):123-132. doi:10.7326/m14-1651
12. Suadicani P, Hannerz H, Bach E, Gynzelberg F. Jobs encompassing prolonged sitting in cramped positions and risk of venous thromboembolism: cohort study. *JRSM Short Rep*. Feb 2012;3(2):8. doi:10.1258/shorts.2011.011121
13. Schwarz T, Siegerl G, Oettler W, et al. Venous thrombosis after long-haul flights. *Arch Intern Med*. Dec 8-22 2003;163(22):2759-2764. doi:10.1001/archinte.163.22.2759
14. Howard BJ, Fraser SF, Sethi P, et al. Impact on hemostatic parameters of interrupting sitting with intermittent activity. *Med Sci Sports Exerc*. Jul 2013;45(7):1285-1291. doi:10.1249/MSS.0b013e318285f57e
15. Zhai L, Zhang Y, Zhang D. Sedentary behaviour and the risk of depression: a meta-analysis. *Br J Sports Med*. Sep 2 2014. doi:10.1136/bjsports-2014-093613
16. Schmid D, Leitzmann MF. Television Viewing and Time Spent Sedentary in Relation to Cancer Risk: A Meta-Analysis. *Journal of the National Cancer Institute*. July 1, 2014 2014;106(7). doi:10.1093/jnci/dju098
17. Maher CA, Mire E, Harrington DM, Stalano AE, Katzmarzyk PT. The independent and combined associations of physical activity and sedentary behavior with obesity in adults: NHANES 2003-06. *Obesity (Silver Spring)*. Dec 2013;21(12):E730-737. doi:10.1002/oby.20430