SITTING
THE NEW SMOKING

Even if you’re fit and active, that desk job is seriously bad for your health

BY RICHARD LOVETT
FROM NEW SCIENTIST
Michael Jensen is talking to me on the phone, but his voice is drowned out by what sounds like a vacuum cleaner. I’m used to bad connections, but Jensen isn’t using Bluetooth on a busy freeway. He’s in his office at one of the top medical research facilities in the US.

“I’m sorry,” he says when I ask about the noise. “I’m on a treadmill.”

I’d had a similar experience earlier with David Dunstan, an Australian researcher who talked to me on his speakerphone as he walked around his office at the Baker IDI Heart and Diabetes Institute in Melbourne.

Both Jensen and Dunstan are exercise researchers looking into the link between sitting down and premature death. And what they have found is disturbing enough for them both to make sure they spend most of the day on their feet.

Jensen explains that he and his colleagues, at the Mayo Clinic in Minnesota, were studying weight control when they discovered that some people “spontaneously start moving round and don’t gain weight” when they have overeaten. These people don’t dash to the gym – they just get up, drive to work, walks into her office, spends a few minutes at the computer, and then it’s move, move, move as she meets patients and demonstrates exercises. She spends much of the day on her feet. After work she goes for a run or rides her horse. She has sedentary moments, adding up to five-and-a-half hours. She sits frequently, but rarely for more than a few minutes at a time. Other than her workouts, her activities are never very intense, but there’s nothing close to my extended writing sessions.

That led them to a field known as “inactivity research”, which is revealing that inactivity, particularly sitting, is really bad for your health – even if you exercise.

In 2010, a team led by Alpa Patel of the American Cancer Society in Atlanta, Georgia, analysed the data from a 14-year study of 123,000 middle-aged adults. When they compared mortality rates between those who spent six hours a day or more sitting and those who reported three hours or less – and taking into account other factors such as diet – they found something surprising. Extra time on the couch was associated with a 40% higher mortality rate for women and 20% higher for men. It is not clear why there is such a big gender difference.

In another study, a team at the University of Queensland, Australia, analysed data on the TV viewing habits of 8800 Australians. They calculated that each hour of TV slices 22 minutes off the average life expectancy of an adult over 25. In other words, people who watch six hours of TV a day can expect to die, on average, about five years younger than those who don’t watch any.

The message is clear. Sitting still for hours at a time is a health risk regardless of what you do with the rest of your day – a bout of high-intensity exercise does not cancel out the effect of watching TV for hours. Patel’s study found that people who spent hours sitting had a higher mortality rate even if they worked out for 45 to 60 minutes a day. The researchers call these people “active couch potatoes”.

But it’s not just the couch that worries them. If the harm comes primarily through the inactivity itself – discounting sleep – the researchers suspect that other kinds of inactivity may be just as harmful as watching TV, be it reading a novel or sitting at an office desk.

To find out just how sedentary people are, Dunstan equipped hundreds of research subjects with accelerometers and inclinometers to monitor their daily activities. The accelerometer measured how energetic their movements were, and the inclinometers revealed how much time they spent sitting.

“The sobering reality is that across 14- or 15-hour day, we’re getting 55 to 75 per cent sedentary time,” says Dunstan. “Moderate-to-vigorous activity – what people like to call ‘exercise’ – occupies just five per cent or less of people’s days.”

Intrigued by our conversation, I began to wonder about my own lifestyle. I have always considered myself to be active, although arthritis has ended my marathon-running days. But maybe I’ve been kidding myself. To find out the reality, I bought an armband with a mix of accelerometers, skin-conductivity sensors and heat-flow detectors to determine my minute-by-minute exertion level.

What I learned was disturbing. On a typical working day, I am inactive for eight hours in total. Although I run up to 25km a week and take long walks, there are periods when I sit for more than two hours at a time writing.

I also gave an armband to a friend, Bhavana Reddy, who is a physical therapist. On a typical working day she gets up, drives to work, walks into her office, spends a few minutes at the computer, and then it’s move, move, move as she meets patients and demonstrates exercises. She spends much of the day on her feet. After work she goes for a run or rides her horse. She has sedentary moments, adding up to five-and-a-half hours. She sits frequently, but rarely for more than a few minutes at a time. Other than her workouts, her activities are never very intense, but there’s nothing close to my extended writing sessions.

Dunstan points out that many professions, such as hairdressers and restaurant workers, probably fall into the same group as Reddy. But once file clerks actually carried files to the places where they were needed. Not anymore. “The modern office worker is engaged with a computer screen while seated at a desk,” he says.

That’s not the lifestyle to which the human body is adapted. “From an
The studies reveal that inactivity produces a complex cascade of metabolic changes. Unused muscles atrophy, and shift from endurance-type muscle fibres, which can burn fat to fast-twitch fibres that rely more strongly on glucose. Inactive muscles also lose mitochondria, the cells’ power packs, which can also burn fat. With the muscles relying more on carbohydrates for what little work they are doing, unburned lipids accumulate. “Your blood is going to become very fatty,” she says, which could be why sitting has been linked to heart disease. Fat also gathers in muscles, the liver and the colon — places where it is not supposed to be stored.

Other changes involve insulin resistance, a diabetes-like condition in which glucose accumulates in the bloodstream even when the body produces insulin to sequester it. All of this happens very quickly. “In three days we have insulin resistance,” Bergouignan says.

So what can people do to avoid this — other than quitting their desk jobs and taking up nursing, hairdressing or waiting tables? First of all, it is important to note that exercise is still good for your health. That’s a message exercise advocates don’t want to get lost in the gloom. “We know that if you exercise 40 to 60 minutes a day, you’re going to have a health benefit,” says Iñigo San Millán, director of the Human Performance Laboratory at the University of Colorado Hospital’s Sports Medicine Clinic in Denver.

Dunstan agrees. “We shouldn’t throw out the well-documented benefits of vigorous physical activity,” he says. Rather, we should think of extensive sitting as another risk factor that should be addressed separately.

But how? One of the things I tried was fidgeting: tapping my feet while sitting at my desk or squirming on my seat. But when I looked at the data from my armband, I could barely discern the effect. Sitting still, I burn 5kJ per minute. Fidgeting raises it to 6kJ.

“Fidgeting isn’t the same as standing up and walking around,” Jensen says. “Contrast that with putting around your home or even going for a very gentle walk.” My armband agrees. The moment I stand up and move around, it starts fluctuating between 12.5kJ and 21kJ per minute. That is hardly vigorous. I easily burn 50kJ a minute while I’m running, but low-intensity activity is sufficient — and it adds up. It all depends on how long you do it for, says Marc Hamilton, an inactivity researcher at Louisiana State University in Baton Rouge.

Jensen thinks that what makes short bouts of activity effective is that they’re enough to burn off some of the glucose accumulated in your bloodstream. “Your bloodstream isn’t that big,” he says. “In the whole body it’s only five litres.” For non-diabetics, that translates to less than ten grams of glucose in the bloodstream. “If you just burn off four grams — 67 kilojoules — that’s a lot of glucose you’ve taken out of the bloodstream.”

It’s easy to burn 67kJ. According to my armband, I can do it within five minutes simply by pacing around the room. That’s also a really good way to clear the mind. “People who get up and move around for five minutes every hour are every bit as productive as people who sit there for hours at a time,” Jensen says.

The next step, adds Dunstan, is to determine the best ways to build activity breaks into the day. Is it best to have frequent short breaks? Or less frequent, longer ones? If you are working on the computer [at home], Dunstan suggests, “Take a break and do the dishes”. If you are watching TV, get up and move around every 20 minutes, or whenever there’s a break.

Patel adds that this may actually come as good news to the millions who have not been able to get their recommended daily exercise. “The take-home message,” she says, “is that anything is better than nothing. Just getting up and moving at all is taking a big step in the right direction.”