

# Newsletter

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## **Being startled by the crash may be worse than the impact**

Sudden contraction of neck muscles blamed

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Do you startle easily? Do you leap off your seat every time you hear a door slam? If so, you'd better hope your vehicle is never rear-ended.

That's because new research shows that it may not be the impact of the crash that causes a potential case of whiplash as much as the surprise.

Working with the Canadian Chiropractic Research Foundation and MEA Forensic Engineers and Scientists Ltd. Of Richmond, Jean-Sebastien Blouin, an assistant professor of human kinetics at the University of B.C., discovered that when you're startled during a car crash, your neck muscles contract. It could be this sudden contraction that leads to whiplash.

We're trying to see if people who develop whiplash injuries have a higher startle response than people who don't suffer an injury," Blouin said Tuesday, the day his research was published in The Journal of Physiology.

Currently, medical science's understanding of whiplash is far from complete, Blouin says. Generally speaking, doctors know that it involves an injury to the muscles and/or ligaments in the neck. But because the neck is such a complex part of the body, precisely what kind of injury often isn't known.

"We know what causes pain in 50 to 60 per cent of patients. But when it comes to the rest, we don't know what's happening," Blouin said.

The fact that our neck muscles contract when we're startled is something physiologists have known for some time. It's just that when they do, it lasts such a short time – just a few milliseconds – so we barely notice it. And then when it's over, there are no lingering after-effects.

But what Blouin's research suggests is that it may be this startle response that makes the difference between getting whiplash and not getting it. Or getting a severe case or a mild one.

Whiplash occurs when a person is struck from behind – usually in a car, but it also has been known to happen on the hockey rink, when the trunk is pushed forward faster than the head. Thus, there is a dangerous moment when your neck is being stretched in a way it shouldn't be.

"The neck is thought to move 125 milliseconds after the onset of the trunk motion," Blouin says, "And at that time we know the neck is going through a period of vulnerability."

"At the same time, we see muscle contraction and this muscle contraction is a response to being startled. And it's this muscle contraction caused by the startle that will make things even worse."

He made his discovery by measuring neck responses in 120 people who volunteered to take part in staged accidents – at speeds of no more than 4 km/h – first in cars and then in a specially designed device that simulates the effects of being rear-ended.

And what he found was that when injuries occurred, they were most severe when the startle response was greatest.

“So the question now is, is the injury caused by startling?” Blouin says.

This, in turn, he adds, suggests that people who are excitable – people who jump when someone claps his hands or a dog barks- might be more susceptible to whiplash than people who aren't.