

Wearing arm splint affects driving ability

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Study finds that arm splints make it more difficult to control a vehicle

An arm splint can negatively affect a driver's ability to control a vehicle—especially if that splint is applied to the left upper extremity, according to **Paul Y. Chong, MD**, who presented the results of a study on driving performance at the 2009 annual meeting of the American Society for Surgery of the Hand.



The research team filmed and interviewed 30 healthy police officers-in-training who were tested on a cone-marked driving course in a randomized, balanced cross-over study. Each cadet made control runs with no splints as well as runs while wearing various types of fiberglass splints, including long arm thumb spica and short arm splints on both left and right sides. The order of the runs was randomized for each participant to minimize learning effects.

The participants were tested on the standardized driving course where they had been training for several weeks prior to the study. The course has an established scoring system, and is normally used to certify the driving skills of emergency personnel.

Scores were based on the time it took to complete the course; a penalty of 5 seconds was assessed each time the driver hit a cone. A participant passed the course if he or she completed the run in less than 230 seconds with fewer than 4 cones hit.

"These cadets are trained to drive in a very specific fashion," explained **Donald H. Lee, MD**, one of the study's authors. "They are taught to use the shuffle steering method. When they're backing up, they're taught to turn to the right and look out the rear window."

Left side splints are worse

The research team found that left long arm thumb spica splints were the most detrimental to performance, with participants' cone-penalized time increasing on average by 22.2 seconds ($p < 0.001$) compared to controls. Left short arm splints were the second most detrimental, with average increases of 16.2 seconds ($p = 0.007$).

"We were not expecting that," said Dr. Chong. "We were expecting that people with right-hand dominance would do worse if the right upper extremity was immobilized."

The researchers found similar trends in the number of cones knocked down and, although the data did not approach significance, left arm splints continued to increase cone-penalized time even when the analysis was limited to portions of the course that did not involve backing up.

The researchers also asked each cadet to rate the perceived difficulty and safety driving the course for each splint used. Participants in the study consistently rated the left long arm thumb spica splint with the highest perceived difficulty and the lowest perceived safety.

"Backing up seems to be quite difficult with a left arm cast, because of the way American cars are designed, with the driver's seat on the left side," said Dr. Chong. "When you back up while looking out the back window, you have to use the left arm to steer. I think that played a large part in why people didn't do well with a left-arm splint."

What to tell patients?

"This is a best-case scenario," said Dr. Lee. "These were trained drivers who had no pain. They didn't have a fracture or an injury. They had been driving on this course for several weeks. Nonetheless, they had difficulty with immobilization. If we extended the results to the general population, and to drivers who may be in pain as well as immobilized, we can assume that they would perform worse."

Given that, what advice is reasonable for orthopaedic surgeons to offer their patients who may wish to climb behind the wheel of an automobile?

"This test wasn't about liability issues, which are always a concern," explained Dr. Lee. "Driving with a splint does impair mobility. My response to patients is that, as long as they're not going to cause further damage to an injury, they're driving at their own risk. Our job is not to determine whether they have the capability of driving. I think they eventually have to decide on their own or at least know their own limitations."

The study co-authors include: Elizabeth A. Koehler, MS; Yu Shyr, MD; Douglas R. Weikert, MD; and Jeffrey T. Watson, MD. Disclosure information: Dr. Chong—DuPage Surgery Center, Wheaton Brace Co.; Dr. Lee—Biomet, Elsevier; Drs. Weikert and Watson—no conflicts.

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