

Dear Sir,

As editors of biomedical journals that focus on musculoskeletal pain and injury we read first with interest and then growing concern the recent publication by Cote et al. regarding patterns of initial treatment and resulting recovery rates for whiplash injury in Saskatchewan (1). These authors have concluded that, because patients who initially treat more frequently with chiropractors and general practitioners go on to have longer recoveries than those who treat less, the cause of the prolonged recovery is the treatment. Not once in this paper did the authors mention the common sense conclusion that patients with more severe injuries tend to both treat more frequently initially *and* take longer to recover from their injuries. The authors' conclusion that treatment for a painful injury prolongs the duration of the injury is unsupported beyond the misinterpretation of their data and possibly misrepresentation of their results.

The authors claim to have "considered the confounding effect of 87 variables" in their data analysis, encouraging the reader to believe that the only real difference between treatment groups is the number of treatments received by the subjects in the study. This claim is not elucidated in the authors' description of their methods, and is far-fetched given that the total number of subjects in two of the chiropractic treatment subgroups was less than 120 each, and less than 150 each in two others. There are only so many sub-subgroups that a subgroup can be stratified into in order to evaluate and control for all real and possible confounders before there are too few subjects from which to draw any meaningful conclusions. Although Cote et al. claim to have studied nearly 2500 subjects, because of their stated methods they would have had to divide groups of 100-150 subjects into at least 20-40 substrata to control for confounding variables (they do not tell us exactly what they did or how they did it), ultimately comparing non-overlapping groups of minimal or no subjects in some instances. Valid conclusions cannot be drawn from such a data analysis, but without any details of their subgroup analysis there is no way to know what these authors did.

The authors claim to have controlled for injury severity as a potential confounder; however, the only index of injury severity that was measured was pain intensity. Frequency, duration, and distribution (beyond a non-specific indication of pain in a body part) of symptoms were not measured. This difference alone between groups was enough to confound the results of the study by injury severity, rendering them meaningless. Although the authors claim to have controlled for an unbelievable number of variables in their analysis (at least 26 pertaining to symptoms alone) the authors reveal some of the unexplained aspects in their data presented in Table 2 with regard to differences between groups beyond frequency of care. For example, the baseline mean level of headache pain (0-100 scale) for the group of subjects treating with only a chiropractor for more than 6 visits ("high utilization") was reported at 34.7. This was more than *twice as high* as that of the "low utilization" group (1-6 visits) at 15.8. The authors do not tell how their subgroup stratification of 112 and 115 subjects, respectively, controlled for such an enormous disparity between the two groups, or how it would have affected the power of their study. The difference reported in headache pain intensity between the low and high utilization chiropractic groups is not an isolated finding; in fact, in all 6 measurements of pain intensity for the 3 different comparison groups (GP 1-2 vs. >2 visits, DC 1-6 vs. >6 visits, and GP and DC 1-6 vs. >6 visits) the higher utilization group reported higher levels of initial pain in *every one* of 18 measurements.

There were other important differences between the low and high utilization groups, such as their pre-crash health status. More than twice as many of the high utilization DC group subjects sought chiropractic care in the year prior to the crash in comparison with the low utilization group (14.7% vs. 6.8%); this is not surprising giving the fact that 53.6% of the high utilization group had pre-crash neck pain, versus 38.3% of the low utilization group. Additionally, half as many subjects in the high utilization DC group rated their pre-crash health as “excellent” versus the low DC utilization group (19.6% vs. 39.1%). It is clear from the authors’ own data as represented in Table 2 that the higher utilization groups hurt more and had more pre-existing problems than the lower utilization groups. Here is yet another common sense conclusion overlooked by the authors: patients with relatively poorer pre-crash health are more likely to be more significantly injured in a crash in comparison with their healthier counterparts, and they are also more likely to require more initial treatment as a result. Contrast this with the authors’ conclusion that it is the “clinicians who *promote* frequent visits (emphasis added).”

It is not surprising in the least that the more significantly injured and more fragile patients went on to suffer more persisting symptoms following an injury, regardless of their frequency of treatment. What is surprising is how Cote et al. twisted this common sense finding into a new paradigm of healthcare: the more treatment a patient receives, the sicker he or she gets. The authors cite no publications to support their new theory of the dangers of healthcare.

It appears that, despite their frequent claims to the contrary, the authors’ method of stratifying their subjects by treatment frequency resulted in a hopeless confounding of their data by injury severity, because more severely injured patients always will be more likely to seek care more frequently. It is a shame that a paper with such plainly obvious and fatal flaws has appeared in the Archives of Internal Medicine. It is our opinion that this paper should not have been published.

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¹ Cote P, Hogg-Johnson S, Cassidy JD, Carroll L, Frank JW, Bombardier C. Initial patterns of clinical care and recovery from whiplash injuries: a population-based cohort study. Arch Intern Med. 2005 Oct 24;165(19):2257-63.