Comments on WCRI’s “The Impact of Opioid Prescriptions on Duration of Temporary Disability”

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Author’s note: I have shared these concerns with WCRI and they have declined to discuss my comments. As a scientist, I believe it is irresponsible for institutions to not respond to comments about their research published in the public domain. The research performed by WCRI influences the care of injured workers and this commentary is only intended to progress the occupational health research field for the benefit of those we serve— the injured worker.

In their report, Savych et al. (2018) analyzed workers’ compensation (WC) records to causally link opioid prescriptions with temporary disability durations. While the authors should be commended for investigating such an important topic, there are substantial limitations in this study and clarification is needed for policy makers to appropriately use this report in decision-making.

Medical researchers and clinicians have established that many opioid prescriptions are inappropriate and may cause adverse health outcomes. Whereas the authors at the Workers Compensation Research Institute (WCRI) found that opioids were associated with disability durations, WCRI fails to control for the specific low back diagnosis for each case, treating patients with a backache similarly to those with herniated discs. Therefore, it is not surprising that opioids would be associated with longer disability durations, because the specific type of low back condition would drive both opioid use and length of disability duration. This is the classical definition of a statistical confounder, and readers cannot distinguish the percent contribution that diagnoses and opioids each has on disability durations (Figure 1). For example, a patient with a non-specific backache would be less likely to be prescribed opioids and would typically have a shorter disability duration than one with a herniated disc, radiculopathy, or myelopathy. It is misleading for the authors to state (page 19), “Our controls categorize injury severity based on the diagnosis and the treatment that workers received.” Instead of controlling for diagnosis for all cases, the authors only attempted to control for diagnosis within their small subset of surgical cases (~13%), which is inadequate to remove the confounding effect of diagnosis on their associations. In addition, the authors posit that their instrumental variable approach removes confounding by diagnosis, but their instrumental variable is prescribing patterns of all low-back cases within a geographic region and would not control for the confounding by diagnosis. To reduce the likelihood of misinterpretation, the authors should correct their text and acknowledge that their analysis does not control for diagnosis in a limitations section.

In addition to grouping all low back diagnoses together, WCRI fails to investigate the most important aspect of opioid prescriptions — whether an opioid prescription was appropriate. The authors did not attempt to distinguish between appropriate and inappropriate opioid treatment in their report. For example, no information is provided to determine if the opioids were prescribed outside of evidence-based guidelines based on the primary diagnosis, the number of days prescribed, treatment dose (morphine equivalents per day), or use of long-acting/extended release opioids. In toxicology, dose makes the difference between therapy and poison, but the only metric reported of opioid strength is cumulative morphine equivalent amount (MEA) with no additional information on the days’ supply these prescriptions covered. Further, the lack of information on the timing of the prescriptions does not allow the reader to make any important conclusions concerning the impact of opioids on disability duration. Other than their “longer-term opioid prescription” metric, we have no knowledge of when any of the
opioids were prescribed within the 24-month period they studied. There is a large difference in an individual prescribed 2,400 MEAs within a couple of weeks of their injury versus over the course of 24 months. Without this vital information, one cannot interpret WCRI’s results in the context of the recently published literature on the topic of inappropriate opioid use.\textsuperscript{4-6}

Despite the authors purporting to perform a causal analysis with their instrumental variable approach, several substantial methodological limitations cancel out any possibility of understanding causality. For example, one of the nine Bradford Hill’s criteria for causality is temporality.\textsuperscript{7} Temporality is a fundamental epidemiological principle and means that the effect must come after the cause. However, WCRI collects opioid prescriptions up to 24 months after an injury, despite the fact that the median disability duration was 9.6 weeks (2.5 months) or ~10% of their follow-up time. It is unknown how and whether this limitation biases the results towards or away from the null, but it should be corrected.

The instrumental variable approach utilized by WCRI to estimate a causal effect of opioids on duration ignores the geographic variability of other factors that would affect duration. A fundamental assumption of the instrumental variable approach is that instrumental variables must not have an independent effect on outcome except through exposure.\textsuperscript{8} Therefore, the authors believe that the location of the patient (used as their instrumental variable) does not have an independent effect on disability duration except through opioids. Put more simply, the authors believe that opioids are the only factor that affects disability duration in the Hospital Referral Regions (HRRs) in the 26 states studied, other than the geographic variables they controlled for (i.e., rurality, county unemployment, percent disabled, and percent with less than high school education). However, we know that both non-pharmacological treatment and diagnostic intervention variability exists across geographic regions for low back disorders.\textsuperscript{9,10} Although the authors acknowledge (page 23), “Another potential issue that could undermine the validity of the IV [instrumental variable] is if physicians who prescribe opioids also use other practices that lead to longer durations or disability (including disability assignment.)” Without substantiation, the authors believe there is, “less reason to believe that individual-level treatment variation (aside from opioid prescribing) varies with HRR-level opioid prescribing.” It is my opinion that this statement is false and that both non-opioid treatment and overall disability management can vary by HRR and influences disability duration.

Savych et al. and WCRI’s research goals are laudable, but the methodological limitations of this study make the results inaccurate and could wrongly affect policy making. As an industry, we cannot make a blanket statement that opioids triple temporary disability duration without the proper methodology and analysis to back up that claim. For some individuals suffering from severe low back conditions, opioids may be the appropriate treatment option for temporary pain relief. Therefore, future research must focus on understanding how proper opioid prescription, as determined by diagnosis and treatment, can prevent abuse, reduce disability duration, and improve overall care. Only through methodologically sound analyses can researchers provide policy-makers with the high-quality evidence they need to make rational decisions in the workers’ compensation industry.
Figure 1. Directed acyclic graph illustrating how the low back diagnosis is a statistical confounder in the association of opioids on disability duration

References


