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Title	**Association between continuity and access: A retrospective multilevel cohort study**
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Reviewer 1	Dr. Lee Green
Institution	University of Alberta, Family Medicine
General comments and author responses	1. The physicians in the Chinook PCN had patient panels, so a structure maximizing CoC was in place. In terms of generalizability, that makes it easier to achieve CoC in their setting, but that may actually provide a more meaningful test of their particular question. The measures of access and continuity are appropriate. One can quibble endlessly over access measurement (and many do), but the TNA is widely used in both operational management of health care systems in the developed world, and in the literature, so choosing it makes this work interpretable in the larger context of health services research. Dr. Green's Comments 2. The outcome measures are well thought out and explained. The basis of recording will weight the continuity of patients with higher care needs more heavily. That is probably appropriate, but it should be noted that the measure reflects continuity from a system rather than patient-experience perspective. The 50-km radius limitation and addition of discontinuity measurement are strengths. Dr. Green's Comments 3. Most of the important covariates seem to be represented. Two that are not are provider's mean number of patients seen per clinic day and provider years since medical school graduation. The latter is normally included in studies of physician practice patterns but may not be particularly important. The former however likely is, and its omission is a weakness. Authors' Response These are good observations from Dr. Green. We did not have access to the provider years since medical school graduation. In retrospect, we should have added the number of patients seen per clinic day into the models as we agree, it is probably an important variable. We will add this variable into our models in our future work. Location of Response in Manuscript We did not add this to the manuscript. Dr. Green's Comments 4. How were location and complexity operationalized? For location, were there dummy variables for geographic areas, or was Alberta's 7-level rural-urban continuum used? (The area served by the Chinook PCN spans three of those: urban, moderate urban influence, and rural.) Complexity appears to be simply dichotomized at the patient level and reported as percent complex; median complexity as a scalar would be preferable. Authors' Response These are good points. We decided to classify locations as urban (within the city of Lethbridge) or rural (outside the city of Lethbridge). We could have classified a few clinics as modern urban influence but was concerned with the small sample size (only 3 clinics would have classified in the category), so we grouped those clinics in the rural category. And, the definition of patient complexity is a challenging concept. We used the newly developed CIHI grouper as it closely approximated the chronic disease registries located with the physician's EMR. Presenting the complexity as a median scale is interesting, and we may pursue this option with our future work. For this study, wanted to be consistent with all of the confounding variables, deciding to express complexity as percentage. Location of Response in Manuscript We did not address this in the manuscript, although we could add a statement if necessary. Dr. Green's Comments 5. The hierarchical mixed-effects modeling procedure itself appears proper. Some of the variables are commonly skewed however, and information on model diagnostics or if necessary transformations of those variables would be helpful.

	Authors' Response We did not perform any transformation on the confounding variables. Location of Response in Manuscript We did not address this in the manuscript, although we could add a statement if necessary.
Reviewer 2	Dr. Tara Kiran
Institution	St. Michael's Hospital, Department of Family and Community Medicine, Toronto, Ont.
General comments and author responses	Dr. Kiran's Comments 1. The authors should provide more context about the PCPs and health region. They mention 205 practices were measuring TNA -- why were they doing so? Were these practices part of a learning collaborative or other improvement initiative related to office practice redesign? How common/uncommon is measuring TNA in the CPCN? Are the 205 PCPs unique/different compared to the other PCPs in the network? Who are the PCPs -- are they mostly MDs? How are they paid? Fee for service, capitation, other? Are there other incentives to promote access or continuity to the provider or to the clinic? Authors' Response This is a good point. We have added a supplemental document that describes the CPCN and the PCPs. Location of Response in Manuscript Page 5 Dr. Kiran's Comments 2. I would have liked to see a more nuanced discussion about the trade-offs of timely access and continuity. The authors cite a lot of literature but could go further in comparing their findings with those of others. They hypothesize the better access will improve continuity (a reasonable hypothesis). However, in the UK, the government focus on timely access led to reductions in continuity (see writing by Martin Marshall, Martin Roland and others) Authors' Response This is a good point. We would guess most PCPs would agree that it would unreasonable for their patients to experience a three week delay when seeking an appointment. At the same time, those same PCPs would probably agree that it would be just as unreasonable to always offer same/next day appointments for their patients. However, it should be reasonable to suggest that patients could obtain an appointment within 3-4 days. Our future studies will focus on this question. We added a statement in the introduction and conclusion introducing the idea that access and COC are dependent concepts, and a balance between the two should be considered to achieve good outcomes. Location of Response in Manuscript Pages 3, 12, & 13 Dr. Kiran's Comments 3. I am unclear how exactly the authors measured continuity. The most commonly used measure is UPC which is a patient-level analysis requiring 2+ visits and is usually calculated over one-year or more. I am not familiar with the method they used which looks at all visits by all patients of a panel over a one-week period (I looked at the reference 34 but was still confused). Given that this is central to the paper, it needs more explanation Authors' Response This is a good point. In addition to revising the explanation in the methods section, we added a supplemental document to further explain our methodology. Location of Response in Manuscript Page 6 Dr. Kiran's Comments 4. I was not familiar with the analytic approach used by the authors and found this difficult to follow and understand. It seems they compared changes between adjacent years versus looking at overall trajectories during a longer period of time. Can they provide a rationale

	for their approach? Can they make their methods clearer to the readers? Authors' Response We have rewritten the statistical analysis section to provide a rationale. Location of Response in Manuscript Page 6 Dr. Kiran's Minor Comments 1. There are a lot of acronyms which makes the paper difficult to read sometimes Authors' Response We have made those changes throughout the manuscript. Location of Response in Manuscript Throughout the manuscript. Dr. Kiran's Minor Comments 2. In the intro, the authors seem to imply that the concept of PMH and PCP is synonymous with COC. Rather, continuity is one aspect that defines good primary care. Authors' Response This is a very good point. We did not mean to imply that concept and have revised our wording. Location of Response in Manuscript Page 3 Dr. Kiran's Minor Comments 3. I suggest distinguishing in the intro b/w the different types of continuity (e.g. relational, informational, etc). I believe this paper is focusing on relational continuity (with the understanding that the other types are related in this context) Authors' Response This is a good point, although the intent of this study was not developed to explore the different types of continuity. One could argue if a patient has good relational continuity with their PCP, good informational and management continuity would also exist. However, there we also know that is not necessarily the case. The only aspect of continuity we could infer from our study was a component of relational continuity known as longitudinal continuity. In our future work, we will try to explore the different type of continuity. Location of Response in Manuscript We did not make this change in the manuscript. Dr. Kiran's Minor Comments 4. Overall, the intro would benefit from more international context related to access and continuity. I am a bit skeptical that no one else has looked at the relationship between the two before. Authors' Response We have reviewed the literature, and there are a number of studies that explored the relationship between access and continuity, many of which we have referenced. We did not mean to imply that no studies exist. But, this is the first study that empirically demonstrates a linkage between primary care access and COC over a number of years and using the actual panels of the PCPs. We have added some statements in the paper to help clarify our thoughts. Location of Response in Manuscript Pages 3, 11, 12, & 13. Dr. Kiran's Minor Comments 5. Some of the tables (e.g. Table1, Table 2, Table 5) could be moved to an appendix or summarized solely in the text. For Table 6, I suggest the rows in italics could be removed Authors' Response Good suggestions. We have combined Table 2 & 3, and removed the italicized row in Table 6 (now Table 5). Location of Response in Manuscript Page 8, 10 & 11 Dr. Kiran's Minor Comments 6. I would have liked to see the relationship between TNA and continuity measures at baseline Authors' Response

	We did not include the baseline relationship between TNA and continuity. However, Table 3 has the mean and standard deviations of the continuity measures for each year, and Table 4 contains the starting TNA values of the PCPs in the TNA exposure group. We could provide the baseline measures if needed. Location of Response in Manuscript We did not add this to manuscript. Dr. Kiran's Minor Comments 7. It seemed that the majority of TNA trajectories were stable. So the analysis done to understand TNA changes and affect on continuity ultimately involved a smaller number of practices. I wonder if authors could comment on the implications of this in the discussion and whether/how it influences their findings Authors' Response This is a good point. Our future work will explore the characteristics of the PCPs in the stable group. This study focused on the exploring whether our outcome measures were impacted by changes in TNA. Location of Response in Manuscript Page 13 Dr. Kiran's Minor Comments 8. I would be interested in understanding why/how the TNA improved for some practices. Would be nice for this context to be added to the intro, methods and/or discussion Authors' Response TNA was introduced to the clinics (PCPs and teams) through a series of learning collaboratives that explained the principles behind Office Practice Redesign. Improving access is a complex idea, as it requires panel management, balancing demand and supply with activity, examining the panel's return visit rate, etc. There was no singular solution as to how or why some PCPs improved their access, and delving into the "how" would have diverted from the messaging of the study. The how and why pertaining to improving access is multifaceted, and may be better suited in another paper. Location of Response in Manuscript Added some information in Supplement Document 1 Dr. Kiran's Minor Comments 9. The authors measure access to a booked appointment but the concept of access in primary care is changing with the advent of virtual visits, email, more phone use etc. Perhaps the authors can comment on this in the discussion in relation to the findings Authors' Response This is a really good point. Primary care has evolved significantly to include access to team and to different types of appointment. We wanted to start with booked appointments (by examining the TNA value) because it was relatively simple to link that to the physician's claims and emergency room data). Our future work will look at how access to primary care evolved over this time period. Location of Response in Manuscript We did not add any information to the manuscript. Dr. Kiran's Minor Comments 10. The authors sometimes make statements that I think are too bold (and sometimes incorrect). For example, "Merely focusing on COC as the key to good patient outcomes without understanding how access influences COC is shortsighted". I don't think focusing on COC is short-sighted – there is tons of evidence to support the focus and IMO, we don't focus on it enough (at least outside Alberta). Rather, I think they are trying to say that we could be even more successful in improving COC if we understood how access contributes to it. Again, I think important to reflect on what has happened in other jurisdictions (e.g. UK). Authors' Response This is good point. The reason why the sentence in the manuscript was written in that manner was to draw attention to the articles that mention COC and do not mention access. We do believe it is short-sighted to focus on COC and not understand the mechanisms that contribute to obtaining appropriate COC, such as access. Nevertheless, your point is well taken and we have added a clarifying sentence in manuscript.

	Location of Response in Manuscript Page 11 Dr. Kiran's Minor Comments 11. I agree with the authors re: their comments on team continuity. The authors may be interested in this article: https://www.cfp.ca/content/cfp/62/2/116.full.pdf Authors' Response Thank you for referring to our previous article. We have been interested in continuity and access for some time. Location of Response in Manuscript We did not add to our manuscript as we did not was to self-cite. Dr. Kiran's Minor Comments 12. Right now, the limitations section is thin. It includes a few sentences related to the ED findings which I suggest get moved to earlier in the discussion. One limitation not mentioned is the measure of access they used – TNA. Physicians I know think TNA is often a crude measure of access and can easily be gamed. I also think the generalizability of the findings is limited not just by geography but also potentially b/c the study population was engaged in office practice redesign efforts. Were there any risks of misclassification bias? Unmeasured confounders? Limitations related to continuity measurement. Authors' Response Your point is well taken. TNA can be easily gamed because it represents a measure at a specific point in time, which cannot not be validated later. The physicians who were measuring TNA in our study were doing so for their quality improvement purposes, and there was no expectation that they would improve their weekly TNA. The only expectation from the primary care network was they had to continue to measure TNA every week Location of Response in Manuscript We added this to the Supplemental Document 2 Dr. Kiran's Minor Comments 13. The last sentence before the conclusion alludes to a PMH visit. How is PMH defined in the context of the practices in this study. Is that the clinics they worked in? Or the PCP practice itself? Perhaps best not to use that term outside the intro. Authors' Response Very good points. We have removed the term PMH to avoid any confusion. We were referring to a visit to the clinic, and adjusted our language to reflect that. Location of Response in Manuscript Page 13