Reviewer's report

Title: Clinical Decision Support Improves Physician Guideline Adherence for Laboratory Monitoring of Chronic Kidney Disease: A Matched Cohort Study

Version: 1 Date: 27 January 2015

Reviewer: Raquel Greer

Reviewer's report:

The authors conducted a matched cohort study to assess the effectiveness of an automated guideline-based clinical decision support system (CDSS) in improving provider's delivery of CKD care (e.g., laboratory monitoring and achievement of laboratory targets) among patients with stage 3-4 CKD.

Major Compulsory Revisions:

1. The intervention targets providers, but the investigators chose to match based on patient characteristics, rather than provider and/or practice characteristics. The investigators need to provide a rationale for why they chose this strategy and include the potential limitations of this approach in the manuscript.

2. Selection bias is a major concern with observational studies (versus an RCT) and the investigators fail to fully address this limitation in their manuscript. I believe this study has a very high potential for selection bias and the authors provide no information in their paper to demonstrate that the providers in the control group and the CDSS group are comparable (e.g., years in practice, practice type (academic, community based, etc), region, urban/rural, patient demographics, etc). The concern is that the providers who opt to participate in the CDSS are somehow different than the control providers? Perhaps the providers who opted to participate in the CDSS are more interested in care quality and/or perhaps already deliver higher quality care in general. It would be helpful if the investigators could assess providers’ pre-intervention performance and determine if providers’ performance in meeting these CKD metrics were equivalent between the two groups at baseline, as well as assess if their performance improved with the implementation of the intervention.

3. It seems very problematic that race is missing for the majority of the study population. This is an intervention study to improve CKD care, but the investigators are unable to correctly identify their study population as truly having CKD. Additionally, they are not able to assess providers’ achievement of guideline-concordant care based on a patients’ actual estimated eGFR. This is a significant limitation/concern of the study and for future implementation if race data is routinely not provided when laboratory studies are performed. Did the investigators provide recommendations to physicians for both the African American and non-African American estimated eGFR? If not, the potential for this intervention to label a patient as having CKD when they don’t have it is very troubling.
4. The investigators need to provide more detail in their methods section regarding the following:
   o The study period is unclear. When was the study conducted (total period)? What was the period for identifying the study population?
   o The investigators describe that their study strengths was the wide geographic distribution and range of practice sizes, but do not provide details of the reach of the intervention in their methods section.

5. The investigator provided limited information in the background to support the significance of their research question and the potential implications of their study findings, including why is improving CKD care important, what are barriers to providers following CKD guidelines, how does CDSS address this, and what are the evidence gaps regarding CDSS and CKD care. In addition, the investigators, included information in the background that seemed more appropriate for the discussion section (i.e., describing their findings in the context of other studies: “Despite the absence of any organized research…., we were able to show an improved alignment between guideline recommendations and both test ordering and, in two instances, test results.”)

6. Did the authors pilot the intervention prior to implementation? What was the perceived usefulness of the CDSS in informing practice?

7. It would be helpful if the investigators could provide more detail in their discussion of why they think their intervention was successful in improving provider performance while other CDSS focused on CKD care have not shown much benefit. In addition, the authors also need to expand their discussion on characteristics of effective CDSS and how their CDSS possesses some of these characteristics. What does “tested by CDSS creators” mean? How did the investigators test their CDSS? The authors also describe that systems that presented advice within EHR or order entry systems were less likely to be effective. The authors should explain why this is the case and why they think providing advice in the laboratory report outside of the EHR would be more effective in improving a provider’s performance?

8. The authors should include as a limitation that they are not be able to fully capture achievement of laboratory testing, since some patients may obtain their labs from other sites that are not affiliated LabCorp.

Minor Comments:
9. What are the physician specialties that are included in the “other” category. Are they also primarily responsible for providing CKD care?
10. Recommend adjusting analyses for risk factors for CKD progression (i.e. hypertension, diabetes, CVD)
11. For the figures, I found the table portion useful, but not the figures on the right. They did not provide any additional information.

Level of interest: An article of importance in its field
Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests