Reviewer's report

Title: A Comparison of Medical Outcomes and Healthcare Costs in the End-of-Life Between Dialysis Patients with and without Cancer: A National Population-based Study

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Reviewer: Melissa Wachterman

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Review of manuscript "A Comparison of EOL Quality of Care Indicators Between Dialysis Patients With and Without Cancer"

Major Comments:

1. Methods page 9, lines 32-36: See that data spans 2006-12/2012. Presumably can't get data beyond 12/2012 (at this point >6 yrs old)? Given that scope of hospice care not expanded until 2009, about half of data comes BEFORE that expansion. Since that expansion presumably was reflective of an increasing commitment to improving EOL care outside of cancer, you both have a mix of data and also do not have 6 yrs of data. Presumably, care is getting better over time so results may under-rate quality of EOL care for dialysis patients, both with and without cancer, over the past 5 years. Not an absolute fatal flaw but certainly does weaken the conclusions and implications of the study. Not much can do other than state in Limitations section (unless can add more recent data, which would significantly strengthen study.

2. Methods page 12 lines 30-33 - say examined survival probabilities with KM methods, but then I don't see anything in Results? This would be important b/c if survival very different between D and DC groups, one with longer survival has longer period of time within last month of life to have long stays, >= hospitalizations, ICU stay etc.

3. Table 4: Quite confusing, difficult to digest to have all of the OR's in the Table. Seems like main point is not to conduct an analysis of all independent predictors of quality indicators but rather to compare between dialysis patients with and without cancer. So would focus Table on that and modify Methods last line page 12 first line 13 to say that is the focus of the modeling. (could include what is currently Table 4 as an Appendix table)

4. Results page 14-15 lines 56-10: Technically incorrect to say "RISK", it is ODDS. Calling it risk generally overstates the findings.

5. Another sizeable limitation of this study that is not acknowledged is that the only predictors/covariates that you have come from administrative data. Presumably variables like patient treatment preferences play a very big role in affecting the 'quality' markers that you measure and I would argue that the true measure (or at least one very important measure) of the quality of EOL care is "goal concordant care" - in other words, do patients receive care consistent with what they want. Preferences may vary between dialysis patients with vs. without
Minor Comments:

1. Introduction page 6 line 19: Not sure what this sentence means. Are they saying that using quality indicators focused on the last month of life is generally accepted as a good evaluation of the quality of end-of-life care? I agree with that statement but as written it's not clear.

2. Introduction page 7 lines 10-20: They write "numerous benefits from hospice care", but then all of their citations about reduction in symptom burden, improvement in QOL and mood, survival, caregiver outcomes are actually benefits from palliative care, not hospice. Will want to clarify this and add citations supporting benefits of hospice care.

3. Introduction page 7, lines 42-45: Meaning of the following sentence is unclear to me: "Dialysis is also associated with higher risk of cancer in patients with ESRD". Higher risk relative to who? Are they saying that of all patients with ESRD, those who do dialysis (relative to those who choose conservative management) have higher rates of cancer? Or that those with ESRD bad enough to require dialysis (relative to those whose ESRD is not quite as severe such that they don't need dialysis) have higher rates of cancer? I am not a nephrologist, but my understanding is that once you categorize someone as ESRD they fall into one of the following buckets: 'dialysis', 'transplant' or 'conservative management' so it seems that only the former explanation would make sense here... OR are they trying to say that those with ESRD have higher risk of cancer than the risk of cancer in the general population (in which case they should say "Patients with ESRD have a higher risk of cancer than the risk of cancer in the overall Taiwanese population".

4. Introduction, page 7, lines 45-52: Then the next sentence (that starts "In Taiwan, most patients..."), while relevant, seems a little out of place since it does not make a connection to hospice. It raises another, broader question/issue I have which is I think an important point to clarify/make is whether, as is true in the U.S. under Medicare criteria, patients who would qualify for hospice via a hospice diagnosis of ESRD cannot receive hospice until they discontinue dialysis. HOWEVER, if they have a hospice diagnosis of cancer, then they CAN get dialysis. Is that true in Taiwan? If that policy is similar in Taiwan, I think that point needs to be made somewhere. I have done a quick re-write of the paragraph just to give authors sense of what I'm thinking (note I also include an Attachment with Track Changes of the paragraph):

"In Taiwan, the use of hospice care has gradually progressed since 1983, and the first hospice ward was established in 1990 [21]. In Taiwan, the hospice care system includes both inpatient hospice care, which is the predominant type, and home hospice care, and both are covered by Taiwan's National Health Insurance (NHI) program. Since 2009, the scope of hospice care was extended beyond cancer to another eight serious illnesses, which includes ESRD. However, the majority of hospice care continues to focus on treating patients with advanced cancer. [As you will see in Attachment with track changes, not sure what to do with following sentence...] Dialysis is also associated with a higher risk of cancer in patients with ESRD [22]."
To qualify for hospice, patients must discontinue life-extending treatments directed at their hospice diagnosis, which includes dialysis for those with a hospice diagnosis of ESRD. In Taiwan, most patients with ESRD choose dialysis until death because there are minimal financial barriers to health insurance access, convenient medical access, and high-quality dialysis [23]. Thus, these patients are not eligible for hospice unless they have another hospice diagnosis such as cancer. Therefore, we compared the quality of EOL care between chronic dialysis patients with and without cancer.

5. Methods page 9, lines 23-27, should include the ICD-9 procedures codes used to identify HD and PD (could go in an appendix)

6. Should define "major episodes in the last month of life"? Not explained in 'Definitions' section - I had to dig into Table 3 to find it's things like having an MI, sepsis etc right?

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