CHRONIC KIDNEY DISEASE CHART AUDIT: IMPROVING PATIENT CARE IN STEINBACH, MB.

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Introduction

Chronic Kidney Disease (CKD) is endemic to Manitoba. One in ten Manitobans have CKD, and the province has the highest rates of end stage renal disease (ESRD) in the country.[1,2,3] Identifying patients as having CKD early and monitoring their decline helps healthcare providers initiate earlier treatment and minimizes long-term loss of kidney function.[4] It also helps the health care team to adjust medication doses appropriately according to glomerular filtration rate (GFR).[5,6,7]

This chart audit of Steinbach Family Medical was undertaken in order to improve care of patients with CKD. It endeavoured to answer two specific questions: How many patients meeting criteria for CKD have the disease identified in their active problems list? And going one step further, does being labelled as having CKD affect whether patients' Albumin-creatinine ratios (ACRs) are measured according to Manitoba guidelines? Measuring a patient's ACR allows for the calculation of their Kidney Failure Risk at 2 and 5 years, respectively.[4] As such, it is an important part of making decisions for patient care and eventual referral to nephrology.

The chart audit was about improving patient care in the clinic as well as data collection, so there were also other components to the project as well. These included notes left for family doctors regarding lab data and patient medications which will be explained further in the methods section.

Methods

In order to ascertain which patients met the criteria for having CKD and whether they had been labelled as having it in their charts, the 'Looker' function in Input Health® (Electronic Medical Record [EMR] system for Steinbach Family Medical) was used to collect data. One list was created that included all patients with CKD in their active problem list. Another list was made that included all clinic patients who had ever had an eGFR reading below 60.

Beginning with the patients who had eGFR values below 15, all eGFR readings were consolidated for each patient. Next, each patient's chart was systematically evaluated in order to determine first whether the patient was a current patient of the clinic, and next whether they met the criteria for CKD. Criteria from the Manitoba Renal program was used.[1] The patient needed a minimum of two eGFR readings below 60 mL/min that were taken more than three months apart or other markers of kidney damage such as: abnormality on histology or imaging, albuminuria (ACR >30mg/g), or a history of kidney transplant.[1] All individuals who were no longer patients at the clinic, or who did not meet criteria for having CKD were excluded from our study. The number of patients labelled as having CKD before that audit was noted before the next step began.

For each patient who met criteria for CKD, the chart was examined to see whether CKD was identified in their active problem list. If CKD was not in the problem list, then it was added, and the current stage of kidney disease was recorded on the chart as well. In addition, a pop-up note was left for the physician that it was now on the patient's problem list. Next, lab data was examined to see when the patient's most recent ACR had been done and this date was noted. When the eGFR is between 15 and 59.9, and ACR<100 without hematuria, Manitoba Renal Program (MRP) recommends repeating the ACR every 1-6 months (depending on the exact

eGFR).[1,2,3] If the ACR had not been measured in the last six months, a note was left for the physician, recommending retesting the ACR. If the ACR was up to date, then the Kidney Failure Risk Equation (KFRE) tool was used to calculate the patient's risk of kidney failure in the next 5 years. This information was also added to the chart. Lastly, the patient's medications were reviewed. If any medications required dose adjustment or were contraindicated in CKD, then a note was left for the physician to review medications and/or dosing for this patient.

Results

In this chart audit, 512 out of the 1377 patient charts with at least one eGFR value <60 ml/min were reviewed. Patients meeting criteria for Stage 3b-5 CKD were all completed, while there were still 865 patients who had at least one eGFR between 45 and 60 (stage 3a) who needed to be audited. Of the 512 patient charts reviewed, 354 met the criteria for CKD. Of the patients meeting criteria for CKD, an overall average of 37% were labelled with CKD in their charts. This was further broken down by the stage of CKD, as seen in Table 1. 28% of patients in stage 3a were labelled with CKD, and the number labelled trended upwards until stage 5, when 65% of patients were labelled with CKD. Before the chart audit began, there were 275 patients with CKD on their active problems list. After the audit was complete and charts had been updated, this number increased to 490 patients.

Table 1: % of clinic patients who meet criteria for CKD who are also labelled as having CKD in their chart. Patients are separated by their stage of CKD.

Stage	Percentage
3a	28%
3b	35%
4	51%
5	65%

Of the 354 patients who met criteria for CKD, an overall average of 29% had had an ACR measured in the past six months, which is the longest recommended waiting period by the Manitoba Renal Program (MRP). Table 2 breaks down this data by stage of CKD, and by whether or not the patient was labelled with CKD on their chart before the audit began. Overall, 53.8% of patients with CKD on their chart had up to date ACR measurements, while only 25.3% of patients without CKD on their chart had up to date ACR measurements.

Table 2. % of patients meeting criteria for CKD who have had an ACR measurement within the last six months.

Stage	CKD on chart.	CKD not on chart.	p-value
3a	55%	21%	p<0.001
3b	39%	23%	p<0.05
4	21%	17%	p>0.05
5	100%	40%	p<0.05
Overall	53.8%	25.3%	p<0.001

As medications were being reviewed for those requiring dose adjustment, data was collected on this as well. Table 3 shows the numbers of patients with each stage of renal disease who were on medications that would require adjustment at some stage of the disease. It is important to note that this does not reflect whether or not the medication required adjustment at their current eGFR value.

Table 3. % of patients meeting criteria for CKD who were prescribed medications that were either contraindicated or required dose adjustment at a particular eGFR value.

Stage	Percentage
3a	55%
3b	75%
4	66%
5	40%*

*of patients who were not on RRT.

Discussion

This project began as a follow up to the Home For the Summer project undertaken by Justin Feilberg in 2018 at Steinbach Family Medical, which was a QI project aimed at promoting physician use of some of the helpful features of the new EMR, Input Health®, which the clinic had recently (early 2018) switched over to from Jonoke®. That project involved creating a template to encourage clinicians to use the template feature; this year, the focus was on conducting a chart audit of patients with eGFR values recorded in the range of CKD, and investigating whether or not use of the 'active problem list' feature led to better patient management outcomes, as defined above. If so, the aim of the project would be to promote better participation of using this feature among physicians at SFM.

To review, the questions asked by this study were: first, how many patients meeting the criteria for CKD have this correctly labelled in the 'active problem list' of their EMR; second, how many patients with CKD have an ACR which is current under the MRP guideline; third, how many patients with CKD are on medications which require management adjustment in CKD; and lastly, could any correlation be identified between labelling of CKD on the active problem list and better management of CKD with respect to routine ACR testing and medication management.

For the first question above, we were encouraged to recognize that SFM was still only 18 months into using Input Health® as their EMR, and as such, not all clinicians may be aware of or interested in using, some of the features in the EMR, including the 'active problem list'. Individual clinicians have different styles or preferences for recording their patient encounters and keeping on top of the management of their patients' issues, and the decision whether or not to use a particular documentation aid does not necessarily reveal anything about the individual clinician's diligence in care. Still, we were curious to see if having the visual cue of CKD on the sidebar of the patient chart when a clinician opened a new encounter for that patient, would manifest itself with better management (i.e. timely ACR testing and active

management of medications) when looking at the entire pool of CKD patients. The raw data that we got from using the 'Looker' function on Input Health was a list of eGFR values, with accompanying dates, and patient identifiers such as age, gender, and patient chart number. This required us to go into each individual patient's chart to examine the particulars of their situation: did they meet CKD criteria, when was their most recent ACR done, and what medications are they currently on?

The first part was relatively straightforward: we simply compared the patient's eGFR values and dates with the criteria we listed to decide whether this patient had CKD, and then checked if this was documented on their chart under the 'active problem list' section. When we began our audit, there were 275 patients at the clinic with CKD listed under 'active problem list'. As we proceeded to add this label where it was appropriate but missing, by the end of our project there were 490 patients with this label. As can be see above in Table 1, the more progressive a patient's CKD was, the more likely it became that it would be listed in the 'active problem list'. Since there are fewer patients with higher stage CKD than lower stage, this indicates that labelling of CKD was not simply related to clinician preference to use the 'active problem list' tool since if only some of the clinicians were using the tool, and using it judiciously for all patients meeting CKD criteria, than we would expect similar proportions of patients in each stage of CKD to be labelled as such (assuming random distribution of CKD patients amongst clinicians). Clearly, patients in the earlier stages of CKD were not being labelled as frequently.

Additionally, as mentioned above in methods, we used the Manitoba Renal Program guidelines for ACR testing as our benchmark. In order to simplify our study, rather than using the scaling criteria dependent on the current stage of CKD, we used the most generous guideline cut-off of having and ACR done every six months. This enabled us to code our data in a binary fashion, which we believed facilitated the display of this information to clinicians. Overall, there was a lack of ACR testing, with less than 30% of patients with CKD having had this test performed in the previous six months. Interestingly, however, having CKD labelled on the 'active problem list' made it more than twice as likely (p-value<0.001) that an ACR was done in the last six months (Table 2). This led us to believe that having that CKD label in the 'active problem list' was contributing to better management of those patients.

Similarly, we received much counsel from the resident clinical pharmacist about management of medications in CKD. In the end, it was much too complex and tedious to review each patient's drugs, one at a time, since we were not privy to the underlying circumstances surrounding their care, and simply reading down the EMR was not felt to be sufficient grounds to make a judgement as to whether or not medication management was appropriate. As a compromise, we asked the clinical pharmacist to provide us with a resource that contained a list of commonly prescribed medications that required review in CKD.[5] This allowed us to quickly cross-reference with each patient's chart, to see if there were any medications which would require additional consideration for CKD, and we coded this data in binary fashion, again, to facilitate information delivery and to avoid make any erroneous judgements about whether medications were inappropriate. We found that the likelihood of a patient being on a medication that either required review or was contraindicated, decreased with advancing stage of CKD. However, approximately two-thirds of those patients meeting criteria for stage 4 CKD were still on meds requiring review. As previously mentioned, due to the nuances of individual

patient circumstances, we did not feel it would be appropriate to comment further on what this might mean. For example, a patient may have advanced CKD, but also be in palliative treatment for advanced metastatic cancer, in which case we are not in a position to say that medications were inappropriately prescribed. Due to this ambiguity of the medication management, we decided rather to display the information about medication management as an FYI for the clinicians that there may be patients whose medications require review. As mentioned above, this was supplemented by the inclusion of pop-up reminders to the clinicians that would appear when they next opened the patient's chart on Input Health®.

By coding each of our question responses as a simple yes or no, it facilitated the display of our statistics to the clinic, which was a key consideration since this was meant to be primarily a quality improvement project. When we presented our project to the clinic at a lunch-talk, we felt that overall it was well-received. Two questions in particular from the audience generated some discussion. First, are the high levels of CKD and ESRD found in Manitoba as a whole, also reflected in the local patient population in Steinbach? We were not able to answer this question, and it was revealed that there has been considerable discussion in Steinbach about whether or not there is sufficient need to fund a dialysis unit at the local hospital, Bethesda Regional Health Centre. The second question was whether or not accurate labelling of CKD on the problem list, and the concomitant increase in ACR testing, lead to better quality of life or mortality outcomes for those patients? Again, we were unable to answer this question, but acceded that this would be interesting to know, since we were advocating a stronger adherence to the MRP guideline for ACR testing. Clearly, some physicians felt that subjecting patients to more routine bloodwork and clinic visits might constitute more harm that the benefit from the information about CKD progression would provide was worth.

Conclusion

Our chart audit clearly identified that there were many patients who met the criteria for CKD that did not have this labelled on their 'active problem list'. However, as mentioned above, we cannot make a value judgement on individual preference to use a particular tool like the 'active problem list', but rather we noted that when looking at the pool of CKD patients, that more severe CKD led a higher likelihood of labelling, and better labelling on the 'active problem list' did in fact lead to more routine ACR testing. As for a relationship between CKD labelling on 'active problem list' and better management of medications, we did not feel comfortable to make any claims without knowledge of the individual patient circumstances that was not possible for us to obtain in the timeframe that we had to work with. This would have required one-on-one interviews with each physician about each of the patients in question. What we took away from our project was that CKD is a complicated disease, with many considerations about management of medications and routine testing. It is helpful to have guidelines to follow, but these must be considered in light of the individual patient and their circumstances, concerns, personal values, and physician insight.

As a follow-up to our project, it would be interesting if someone was able to continue working through the patients with eGFR values falling into the CKD stage 3a (45-59) range, to see if the trends were similar among that group. This was the majority of the patient population identified for our study using the 'Looker' function of Input Health®, but we simply ran out of

time to audit all of the charts. It was noted as we began auditing the patients in this category that there was a much greater proportion of the patients being excluded from the study on the basis of not meeting the criteria for CKD. This stands to reason, since it is not uncommon that one might have a medical event where a single eGFR value below 60 was recorded, but not being indicative of kidney disease. Furthermore, it would be interesting to look prospectively at whether or not a concerted effort by the clinicians at SFM to increase labelling of CKD would lead to an increased level of ACR testing and/or more timely management of medications among these patients. And finally, we recognize the importance of CKD management, but there are many other conditions that a study like this one could be conducted for.

It is important that we recognize the contributions made to this project by the other professionals working at Steinbach Family Medical (SFM). In particular, Dr. Mark Duerksen, MD, CCFP, FCFP; and Dr. Karen Toews, MD, CCFP, FCFP; both senior physicians working at the SFM, both conceived of the project, and gave considerable input along the way as we worked to make it better and resolve any issues that arose. Also, Dr. Grace Frankel, PharmD; the clinical pharmacist at SFM who was instrumental in guiding our understanding of appropriate drug management in CKD. Several other physicians working at the SFM took time to hear about our project and provide their perspective on ways to improve our study, and we are thankful to them, as well.

Sources

1. Manitoba Renal Program. Kidney Disease Referral Pathway. Manitoba Renal Program. kidneyhealth.ca. Published 2018.

2. Manitoba Renal Program. Diabetic Nephropathy Management Guidelines. Manitoba Renal Program. kidneyhealth.ca. Published 2017.

3. Manitoba Renal Program. Non-Diabetic CKD Management Guidelines. Manitoba Renal Program. kdineyhealth.ca. Published 2017.

4. Webster AC, Nagler E V, Morton RL, Masson P. Chronic kidney disease. *Lancet*. 2017;389(10075):1238-1252. doi:10.1016/S0140-6736(16)32064-5

5. Munar M, Singh H. Drug Dosing Adjustments in Patients with Chronic Kidney Disease. *Am Fam Physician*. 2007;75(10):1487-1496. https://www.aafp.org/afp/2007/0515/p1487.pdf.

6. BC Renal Agency. Antidepressant Use in Adults with Chronic Kidney Disease. BC Renal Agency. bcrenalagency.ca. Published 2015.

7. Canadian Diabetes Association. Therapeutic Considerations for Renal Impairment. *Can J Diabetes*. 2018;42:2671. https://doi.org/10.1016/j.jcjd.2017.10.044.