Decision Support and CKD: Not There Yet

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The publication of the Modification of Diet in Renal Disease study equation in 1999 (1) provided a new clinical tool to improve the identification and monitoring of people with CKD. Beginning in 2002, coordinated efforts were made by the renal and laboratory communities, much of it through the National Kidney Disease Education Program's Laboratory Working Group, to standardize the laboratory assessment of creatinine and to promote the routine reporting of estimated GFR (eGFR) with every creatinine determination performed in adults. This effort has been highly successful. The College of American Pathologists reports that, in 2011, 84% of clinical laboratories surveyed routinely reported eGFR with each adult serum creatinine result (2).

Despite nearly universal reporting of eGFR, the care of people with CKD in the United States remains well below what we all hope for. Systematic identification is lacking, and management based on implementation of evidence-based care is poor; BP is inadequately treated, use of renin angiotensin system (RAS) blockers is incomplete, metabolic complications are not identified and managed, and patients routinely present for initiation of renal replacement therapy with little knowledge or understanding of their disease and their treatment options (3). In response, there have been a number of efforts to use clinical decision support system tools such as laboratory alerts or prompts to improve outcomes in primary care settings, where most patients with CKD are seen. In this issue of *CJASN*, investigators from the Alberta Kidney Disease Network describe their efforts to test the effectiveness of an eGFR-based laboratory prompt to improve the management CKD in >22,000 patients followed in 93 outpatient practices. The trial compared the standard laboratory prompt, which provided a definition of CKD based on eGFR and a recommendation for nephrology referral for patients with GFR<30 ml/min per 1.73 m^2, with an enhanced prompt providing recommendations on measurement of urine albumin, use of RAS blockers, nephrology referral, and management of BP, lipids, and glycemia. Electronic health records (EHRs) were not used in this trial. The primary outcome, assessed only in the 5444 elderly for whom medication data are collected in the Alberta system, was utilization of RAS blockers in patients with diabetes or proteinuria. Secondary outcomes, assessed in all 22,000 participants, included measurement of proteinuria, glycosylated hemoglobin, LDL cholesterol,

management of BP and lipids, and nephrology referral. The study failed to show any differences in use of RAS blockers or clinical outcomes, including referral, between patients whose providers received the enhanced prompt and those who providers received the standard prompt. However, among the subgroup of patients with eGFR <30 ml/min per 1.73 m^2, utilization of RAS blockers was significantly higher in those managed by a provider receiving the enhanced prompt.

Similar disappointing results were seen in another recently published study (4), which tested an EHR-based prompt sent in real time to providers caring for patients with eGFR <45 ml/min per 1.73 m^2. Thirty general internists in a university-based practice received a recommendation to quantitate urine albumin and refer to a nephrologist, if not done within the past year. The primary outcome was nephrology referral; secondary outcomes included measurement of urine albumin, use of RAS agents, BP control, and CKD documentation. The study failed to show that the EHR-based prompt improved care.

Decision support is an important tool but one that can be overused, used inappropriately, or used ineffectively (5). The authors of the study in this issue of *CJASN* demonstrate that an enhanced prompt attached to all reports of eGFR <60 ml/min per 1.73 m^2 is not effective. However, there are several aspects of this study that may mislead providers and cause them to underestimate the utility of decision support:

(1) Some of the interventions recommended in the enhanced prompt are not evidence based or are currently under revision and may have been disregarded for this reason. Although the primary outcome was the proportion of patients with diabetes or proteinuria prescribed an RAS blocker, secondary outcomes for the study included the following: a universal BP goal of 130/80, A1C <7, and referral of all patients with eGFR <30 ml/min per 1.73 m^2 to a nephrologist. Providers for the elderly in the study population may not have judged these interventions as appropriate.

(2) As the authors point out, the baseline use of RAS antagonists was relatively high (77%) in the study population. This rate is similar to RAS utilization in healthcare systems with integrated CKD management programs (6). There may have been little room for improvement.

(3) The exposure of physicians to a prompt in >10% of patients for whom a creatinine test was ordered

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may have further reduced the impact of the intervention through "alert fatigue" (7). Perhaps testing this intervention in a higher-risk subgroup would give a better indication of the utility of an enhanced prompt.

The authors note that their intervention met at least two of the three critical characteristics of effective decision support: advice was provided as part of clinical workflow and recommendations were included in the alert. However, the alert did not meet the third criterion; it was not provided at the time and location of decision making. Although this may have played a role, the authors may be closer to identifying the barriers to successful decision support when they suggest that the providers may have been overwhelmed by the number of prompts, the prompt did not distinguish patients at high risk of progression, and the recommendations were too complex. The finding that there was a significant impact on use of RAS blockers in the subgroup with eGFR <30 ml/min per 1.73 m^2 suggests that, when there is clear evidence of more advanced or progressive disease, providers responded by changing management.

Most nephrologists agree that the greatest opportunity to reduce the burden of CKD is to intervene in the primary care setting, well before specialty referral. A number of investigators have provided insight into the barriers to improving CKD care in the primary care setting, including generalist/specialist collaboration (8). Despite this knowledge, we continue to provide overly complex, sometimes confusing, messages to primary care providers and suggest they be applied based on eGFR alone, without the individual assessment clinicians are taught to use with patients with other chronic illnesses such as congestive heart failure. We simultaneously encourage more management in the primary setting while promoting specialty referral as the most important process improvement, sometimes at eGFRs well above 30 ml/min per 1.73 m^2. We might have better success focusing on a simple recommendation based on strong evidence that could provide clear and immediate assistance to the provider in assessing and managing the patient with CKD. A review describing the effectiveness of eGFR prompts in improving the appropriate management of drug dosing in people with AKI and CKD suggests that clinicians will use decision support when there is a clear and immediate benefit to the patient (9).

The importance of albuminuria in identifying and assessing patients with CKD has become increasingly clear, yet providers often fail to quantitate urine albumin. It would be interesting to test a simple alert encouraging providers to obtain a urine albumin to creatinine ratio on any patient they have identified with decreased eGFR. While this was one of the measures included in the studies described above, in both cases it was linked to additional recommendations including referral based on a fixed eGFR. Focusing specifically on albuminuria would facilitate better identification of CKD patients and help providers identify those patients at greatest risk of progression. Providers are likely to use decision support tools and devote precious clinical time to follow-through on recommended care when there is a clear link to improved outcomes. Let's not abandon decision support. Let's learn do it better.

Disclosures
None.

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