

Preventing Emergency Department Use among Patients with CKD: It Starts with Awareness

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The emergency department (ED) has become the nexus for acute care medicine in the United States. With greater than one quarter of all newly arising medical problems being managed by emergency physicians, who represent <5% of practicing physicians in the United States (1,2), there is increasing pressure on the ED to provide rapid, complete care at all hours. EDs are closing faster than they are opening, and the number of patient encounters continues to increase disproportionately to the rate of growth of the population (3). With approximately 130.8 million patient visits in 2012 alone (4), the ongoing problem of crowding and boarding (5) in the ED will continue to plague the United States medical system until we collectively find solutions. To complicate the problem, approximately one half of hospital admissions now arise from the ED rather than a clinic, pointing to a shift in physician practice (6). Nonetheless, caring for patients in the increasingly crowded ED leads to morbidity, mortality, longer wait times, and more costly care (7); an estimated 10% of all ED costs (\$32 billion) are from potentially preventable visits (8). Although the reasons for increasing ED utilization are multifactorial, recent evidence suggests that the treatment and testing of medically complex patients—such as those with CKD or ESRD—are increasingly performed in the ED and may have a disproportionate effect on ED care (1).

Patients with ESRD have among the highest rates of ED usage, six times higher than the median for United States adults (9). In a study of >700,000 patients with ESRD in the United States, Lovasik *et al.* (10) found that more than one half of patients with ESRD visit the ED within their first year of dialysis, and of these, 46% resulted in a hospital admission. However, less is known about hospitalization and ED use among patients with CKD due to limited surveillance data for this population; thus, the extent to which ED utilization is preventable in this population is also unknown.

In this issue of the *Clinical Journal of the American Society of Nephrology*, Ronksley *et al.* (11) use administrative data from an integrated health system in Alberta, Canada to examine ED use among patients with CKD and patients with ESRD from 2010 to 2011 and determine the proportion of ED visits that are potentially preventable. Among a cohort of >100,000 adults with CKD stages 3–5, not surprisingly, ED use increased as the severity of kidney disease increased: from 919 ED visits per 1000

person-years (95% confidence interval, 914 to 923) among patients with CKD stage 3a to 2451 ED visits per 1000 person-years (95% confidence interval, 2404 to 2499) among patients with CKD stage 5 (including dialysis-dependent patients). The proportion of patients admitted to the hospital from the ED increased from 23.9% among patients with CKD stage 3a to 35.1% among patients with CKD stage 4 and remained high among those with CKD stage 5 (33.0%). Of note, the proportions of patients admitted to the hospital were similar among patients with late-stage CKD and those with ESRD, but compared with general patients, rates of hospitalization for patients at all stages of CKD are relatively high. This increasing rate of ED use and hospitalization has cost implications. In the United States and many other Western countries, the prevalence of CKD and ESRD is rising (10,11); patients with CKD and patients with ESRD already consume a disproportionate share of health care resources at high cost (12). It is, therefore, important to better understand how failures of detection and management of CKD can land the patient in the ED or the hospital and to what extent these episodes of acute care may be avoided by appropriate outpatient management.

In Canada, a country with a universal health care system, the authors reported that only 36.8% of patients with CKD stage 4 and 63.9% of patients with CKD stage 5 had seen a nephrologist in the previous 2 years. However, the majority of patients had at least one visit with their general practitioner (median = 13 visits; interquartile range, 8–21) (11). In the United States, where universal access to health care is not guaranteed, lack of access to primary care has been associated with higher ED utilization rates (12). Fewer than one third of United States patients starting dialysis have seen a nephrologist for >1 year (13), and patients on dialysis with pre-ESRD care have a 10% lower rate of ED utilization (10). The high rate of ED use and hospitalization among patients with CKD suggests that there is a potential for interventions targeting preventable visits to the ED.

One surprising finding of the study by Ronksley *et al.* (11) was that only a small proportion (approximately 6%) of CKD-related ED visits examined was deemed potentially preventable ambulatory care-sensitive conditions (ACSCs) when defined according to the previously developed guidelines by Wiebe *et al.* (14). This seemingly small proportion suggests that the vast majority of ED visits among patients with CKD are not

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preventable. However, there are some limitations to the classification system of the ACSCs used in the study, which included hyperkalemia, malignant hypertension, heart failure, and volume overload. ACSCs that were initially constructed to define potentially preventable causes of inpatient admission, rather than ED use, are likely too narrow and may miss other preventable causes of an ED visit. Ronksley *et al.* (15) recently examined ACSCs among hospitalized patients with CKD in a separate well conducted study and found that about 21% of CKD hospitalizations were potentially preventable. The difference in potentially preventable visits seen in this study (6%) as opposed to the difference found among hospitalized patients with CKD (21%) is reflective of the inherent differences between the reason for ED visits and hospitalization, because fewer than one half of hospitalized patients are admitted through the ED (6). In this study, Ronksley *et al.* (11) found that heart failure represented >80% of preventable causes among patients with CKD and that hyperkalemia accounted for nearly one half of preventable causes among patients with ESRD, but other potentially preventable conditions were likely not considered. For instance, treatment of patients with CKD and anemia with erythropoiesis-stimulating agents has been found to reduce ED visits and inpatient admissions (16). Hypoglycemia may occur in patients with CKD, particularly because insulin and some sulfonylurea medications have prolonged half-lives as kidney function declines. Worsening eGFR is associated with increased risk of hospitalization from infections (17), which may be, in part, preventable by appropriate vaccination or early outpatient treatment. These are but a few examples of the potentially large number of problems that are frequently treated in the ED and that could be amenable to outpatient prevention or intervention but would not have been captured in the ACSC classification system used in this study. We suggest that additional research should involve multidisciplinary efforts to define CKD-related ACSCs that are directly applicable to ED care so as to enable more accurate analysis of the effect of interventions to reduce ED utilization.

This study gives us a novel and comprehensive view of the access of patients to CKD care through the Alberta Kidney Disease Network (18). In the United States, where patients are covered by a patchwork of public and private insurers or are not insured at all, it would be impossible to garner such a comprehensive view of CKD-related ED care—in effect, many United States patients with CKD are hidden from view. Efforts to promote awareness of CKD among patients and primary care providers alike are needed for patients to receive appropriate diagnosis and management and keep them out of the ED. Only 10% of affected United States adults report awareness of their CKD (19). Similarly, primary care practitioners often fail to identify CKD. In the Awareness, Detection and Drug Therapy in Type 2 Diabetes and Chronic Kidney Disease Study, primary care clinicians overall identified only 12.1% of patients with CKD, although correct identification increased for patients with higher CKD stages (20). Furthermore, despite existing practice guidelines, such as the Kidney Disease Improving Global Outcomes program (21), many primary care physicians have limited knowledge of how to screen, monitor, and effectively manage patients with CKD (22). Important educational efforts have been undertaken to target patients and health care professionals, such

as the National Kidney Disease Education Program (23) and the National Kidney Foundation's CKDintercept program, but more needs to be done.

What interventions might a multidisciplinary group of medical providers use to prevent ED utilization? Several recent systematic reviews have examined the comparative effectiveness of different interventions (24–26), and although none have specifically focused on patients with CKD, there may be some lessons learned from other populations that can be applied to kidney disease. Care coordination has been touted as a leading strategy to reduce utilization by the Centers for Medicare and Medicaid Services, and several interventions have aimed to increase care coordination between ED and outpatient providers. About two thirds of these ED-based interventions have been found to be effective in reducing repeat ED visits and/or increasing follow-up (24). Other ED-based strategies have included better case management, individualized care plans, the use of information-sharing systems, managed care, and provider incentives to avoid ED visits, such as capitated payments, and patient financial incentives; the latter two interventions were found to be effective in reducing ED utilization. For patients with ESRD, it will be interesting to see if the ongoing experiment with ESRD Seamless Care Organizations will result in reduced ED visits and hospital admissions. Similarly innovative strategies for the coordinated care of patients with CKD should be considered. Implementation of interventions to reduce ED utilization among any population is likely to incur substantial cost and use of resources. It should be noted that increasing care coordination, while improving patient care and patient outcomes, may not save costs overall (27).

Although the results of the study by Ronksley *et al.* (11) may not be directly generalizable to the United States or other countries due to differences from the Canadian health system, this study is important and novel in that it examines the CKD population that is essentially hidden from researchers and providers in the United States due to our fragmented health system and limited available data. As shown by this study, the magnitude of ED utilization among patients with CKD and patients with ESRD is quite high. Efforts to identify and manage patients with CKD as early in the course of the disease as possible are warranted.

Disclosures

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