Use of the Kidney Failure Risk Equation in Clinical Practice

By Heba Eligbutan and Navdeep Tangri

Patients with chronic kidney disease (CKD) and their practitioners and caregivers want to know the risk of kidney failure requiring dialysis to help them make decisions about referral, treatment, and access or transplant planning. The kidney failure risk equation (KFRE) is the most widely used prediction model in nephrology to assess the risk of kidney failure among individuals with CKD. Developed in 2011, the equation provides an estimated probability of progression to kidney failure over a 2- and 5-year period. The four-variable model includes age, sex, estimated glomerular filtration rate (eGFR), and the urine albumin-to-creatinine ratio and is integrated in clinical practice guidelines. The eight-variable model includes the initial four variables in addition to serum albumin, serum bicarbonate, serum calcium, and serum phosphorus. The KFRE utility lies in its ability to seamlessly integrate into electronic medical record (EMR) systems to guide clinical decision-making for health care professionals to identify high-risk patients with CKD for targeted interventions. It has demonstrated its accuracy across diverse populations and has been validated in over 30 countries worldwide.

In a recent article, “Implementation of the Kidney Failure Risk Equation in a United States Nephrology Clinic,” by Patel et al., the authors used a mixed-methods design to explore the implementation of the KFRE in nephrology clinics. Their findings included an increase in the documentation of KFRE scores over time, reaching 25% of the eligible outpatient nephrology clinic notes by the study’s end. However, the adoption of KFRE documentation varied widely among practitioners, with some incorporating scores in more than 75% of notes, whereas others did so in less than 10%. Surveys and focus groups uncovered disparities in utilization of KFRE for clinical decisions, highlighting practitioners’ uncertainty about the risk-based thresholds in guiding clinical care. Practitioners’ perspectives suggested that KFRE scores could have impactful roles, especially for specific subsets of individuals with CKD, emphasizing the need for additional education to maximize its use.

One of the key takeaways from this study is that it highlights the versatile utility of the KFRE, with aims of extending its relevance beyond nephrology to other disciplines, including the transition from primary care to nephrology. Since its initial validation, independent researchers have confirmed the accuracy of the KFRE, demonstrating its superiority over the subjective opinion of patients or health care practitioners. Nonetheless, implementation remains mixed due to a lack of trust in prediction equations by some practitioners, along with limitations of the equation in early stages of CKD or in patients with unavailable information about albuminuria.

To further aid implementation, we agree with the study’s authors and advocate for strategies to fully integrate the KFRE into EMR systems along with the largest laboratory organizations in the United States and worldwide. Specifically, we urge EMR vendors and laboratory groups to automatically report KFRE whenever an individual’s eGFR falls below 60 mL/min/1.73 m². The study underscores the ongoing need for efforts to optimize KFRE implementation, concentrating on enhancing education of our peers, inside and outside of nephrology, on its interpretation and application.

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References

Figure. Eight-variable KFRE model to calculate risk of kidney failure

In the meantime, ASN will continue to call for improved access to and the novel models of care, better prevention and increased awareness strategies, more funding for research, and greater engagement with patient communities to effectively combat the burden of kidney diseases. A forthcoming article in JASN will review ongoing initiatives that ASN has already undertaken to address the causes of kidney diseases in an effort to reduce disease burden and ultimately save lives.

References