Screening Strategies for Unrecognized CKD

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“An ounce of prevention is worth a pound of cure” is a simple mantra first suggested by Benjamin Franklin. However, the contemporary setting of priorities for preventative (1) health care programs in a system with finite resources involves a set of complex inputs. From a scientific perspective, axioms suggest that medical conditions should be considered for primary preventative care if the burden of disease is high, the screening test is reliable and readily available and the therapeutic intervention is safe, effective, and cost effective. From a societal perspective, priorities may be additionally influenced by local epidemiology, the characteristics of the population afflicted by a condition, and the propensity of certain groups to advocate for their program agendas.

Most of our health care systems are designed to provide episodic care for patients seeking treatment of symptomatic disease. These health system interactions also provide opportunities for primary care teams to screen for, triage, and treat chronic diseases (so-called opportunistic screening). As a general rule, this type of system seems to serve most populations well, adequately identifying chronic conditions requiring treatment. Addition of routine periodic health reviews does not seem to add value. Indeed, two very large systematic reviews and meta-analyses concluded that general practice periodic health increased medication utilization and use of diagnostic testing but did not accrue any net benefit in terms of improved overall or disease specific mortality (2,3). Similarly, in most cases, undirected, population-wide screening for most chronic conditions does not add value to targeted screening of patients presenting for episodic health care who are opportunistically identified as having clinical risk factors for a target condition. There remain, however, millions of vulnerable individuals who are under- or uninsured or live in jurisdictions with reduced access to robust primary care systems for even episodic, symptom–driven care. These marginalized and disenfranchised populations will have limited opportunities to access health care, and thus, for chronic disease detection, counseling and management are significantly limited. In such populations, opportunistic strategies may fail.

In October of 2013, the American Society of Nephrology (ASN) put out a press release strongly recommending “regular screening for kidney disease, regardless of an individual’s risk factors.” This press release stated that early detection and intervention can prevent and slow progression and that screening can help improve and save countless lives. On the same day, the American College of Physicians (ACP) released clinical practice guidelines recommending against screening for CKD in asymptomatic adults without risk factors. These guidelines were supplied with commentary that ordering laboratory tests is not going to have any effect on clinical outcomes of asymptomatic patients without CKD or risk factors and will add unnecessary costs to the system (4). These ACP guidelines were congruent with 2012 recommendations put out by the US Preventative Services Task Force (USPSTF) and the Kidney Disease Improving Global Outcomes (KDIGO) guidelines (5,6).

Numerous universal and targeted screening initiatives for CKD have been undertaken globally in a variety of populations using heterogeneous approaches (7). The Kidney Early Evaluation Program model has been applied in multiple countries in patients with established risk factors for CKD, and it tests for urinary albumin-to-creatinine ratio in addition to eGFR (8). The Kidney Evaluation for You Program in Australia used a similar targeted approach. Large universal CKD screening programs have taken place in The Netherlands, the United States, Japan, China, and elsewhere (1,7,9,10). Geographic targeted screening of unique at–risk populations, such as Canadian First Nations people, has yielded increased rates of CKD over nontargeted universal screening populations (11). What we have learned is that the definition of screening can take many forms from the pragmatic, lower–cost eliciting of individual patient risk factors to the more invasive and costly universal collection of serum and urinary biomarkers irrespective of a patient’s risk factors. Those with risk factors, such as hypertension and diabetes, should have CKD biomarker screening, whereas universal biomarker screening does not yield good value for money (12).

In this issue of the Clinical Journal of the American Society of Nephrology, Galbraith et al. (13) report on the Pan-Canadian See Kidney Disease (seeKD) Targeted Screening Program for CKD sponsored by the Kidney Foundation of Canada. This 3-year initiative screened 6329 Canadians who participated in community or individual targeted screening events. A pragmatic approach to screening was applied, with patients first asked about risk factors. Those with at least one risk factor went on to have a point of care eGFR calculated in addition to a dipstick urinalysis. The vast
majority of patients presenting for screening reported at least one risk factor (88.9%), and of those, 18.8% had unrecognized CKD as defined by an eGFR < 60 ml/min per 1.73 m².

This modality of CKD screening has several key strengths. Applying the filter of first questioning patients on risk factors for CKD is a responsible and evidence-based method of screening. It is consistent with the ASN’s suggestion that all should be screened for CKD in some form. It also reserves laboratory-based biomarker testing for those with risk factors consistent with those used by major guidelines bodies, such as the ACP, the USPSTF, and KDIGO. The ability to target specific populations with increased risk was clearly shown in this initiative, because an extremely high percentage of people had at least one risk factor and a surprisingly high number of those had reduced eGFR. The point of care testing equipment used for biomarker screening in this public health initiative allowed for real time feedback to individual patients on their eGFR. This factor partly explains the high level of engagement of participants seen in the follow-up survey results while maintaining an efficient screening process (as many as 50–60 people per day at screening events). Importantly, Galbraith et al. (13) have attempted to analyze attempts at targeting specific high-risk demographic groups. Although a common screening algorithm was used, Galbraith et al. (13) allowed the provincial chapters to set priorities on whom to target and encouraged communication strategies according to their local epidemiology and expertise.

The targeted seeKD Program checks many of the boxes in support of prioritizing CKD screening as a preventative public health care program. The identification and science behind risk stratification of CKD for progression have evolved considerably since the inception of the seeKD Program. A combination of eGFR and urinary albumin-to-creatinine ratio is now the accepted method of CKD staging (6) to better reflect risk of mortality and progression. Extensively validated risk prediction equations (14,15) using these same biomarkers can be readily integrated into point of care screening algorithms, providing real time feedback to patients on their personalized risk of progression to kidney failure (16).

Cost-effectiveness models exploring CKD screening initiatives are exquisitely sensitive to the background prevalence of CKD and the assumptions made about treatment effectiveness in preventing progression and cardiovascular outcomes (10,12,17–19). There is limited evidence to support that patients with stage 3 CKD with <500 mg/d proteinuria are at high risk of progression to kidney failure or benefit from specific therapies, such as renin-angiotensin system inhibition (20). Although the seeKD Program did incorporate dipstick urinalysis into its screening algorithm, this semiquantitative test is not sufficient to predict risk or stratify those who will likely benefit from treatment (21). Taking these new factors into account, the simple addition of point of care urinary albumin-to-creatinine ratio testing and real time risk prediction algorithms to the seeKD Program screening model would allow for precise estimate of risk and establish criteria for nephrology referral in real time. More importantly, the 920 patients detected with stage 3 CKD comprising 95% of the population with eGFR < 60 ml/min per 1.73 m² could be reassured on their level of risk or immediately referred for care by nephrology teams as appropriate. In addition, those with eGFR < 60 ml/min per 1.73 m² with significant proteinuria (>500 mg/d) who likely benefit most from early intervention with renin-angiotensin system inhibition could be identified and counseled accordingly.

An ounce of prevention is worth a pound of cure for the correctly identified population and the precisely risk-stratified individual. We have come a long way in the last few years in being able to do just that, but health care systems are still not set up optimally to benefit from targeted screening and treatment of some chronic diseases at a population level. The seeKD Program is another example of the possibilities of a well-executed national screening platform. We strongly endorse efforts to continue to implement, evaluate, and refine evidence-based targeted screening programs to reduce the global burden of CKD.

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Disclosures

None.

References


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See related article, “The See Kidney Disease Targeted Screening Program for CKD,” on pages 964–972.