

# Do Kidney Patients Know an App From a Nap?

**Q** It seems that at every conference I attend, a tech/marketing rep stands up to rave about “this” app or “that” online program. My average patient is older than 60 (physiologically 80), has vision issues related to diabetes, hypertension, or cataracts, can’t afford a smartphone, wouldn’t know an app from a nap, and has trouble just managing to eat correctly. What makes these reps think that patients can use technology?

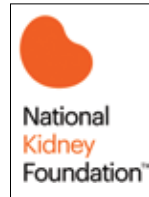
We are often encouraged to incorporate technology into our daily interactions with patients. Meaningful use has us signing up 70-year-old patients for our practice’s patient portal and counting on them to write a message to us so we can receive credit. Our initial response is to groan and ask if the government knows what kind of patients we see.

However, a new article in the *Clinical Journal of the American Society of Nephrology* suggests that our patients may be more tech savvy than we think.<sup>1</sup> The study found that patients with chronic kidney disease (CKD) not only know how to use a smartphone application but also find its implementation useful.

Patients included in the study were, on average, 59 and had stage IV to stage V CKD and an estimated glomerular filtration rate (eGFR) of  $\geq 30$  mL/min/1.73 m<sup>2</sup>. The study assessed knowledge of blood pressure, medications, CKD-related symptoms, and CKD-related laboratory tests.

Although 60% of the study cohort had never used a smartphone before, monthly adherence rates were higher than 80%. Outcomes included a statistically significant reduction in blood pressure, which was attributed to patients’ ability to better monitor their health and reduce their anxiety. The smartphone data sets also helped to identify cases of masked hypertension and more than 100 medication errors, 60% of which required intervention. Subsequent visits with providers were found to be more useful as a result, since both patients and providers had better quality information.

An accompanying editorial cautioned, however, that despite these positive findings, we must be mindful that smartphone ownership is less common among lower income patients. Fifty percent of those making less than \$30,000 per year own a smartphone, compared with 84% of patients with an annual income



The National Kidney Foundation Council of Advanced Practitioners' (NKF-CAP) mission is to

serve as an advisory resource for the NKF, nurse practitioners, physician assistants, clinical nurse specialists, and the community in advancing the care, treatment, and education of patients with kidney disease and their families. CAP is an advocate for professional development, research, and health policies that impact the delivery of patient care and professional practice. For more information on NKF-CAP, visit [www.kidney.org/CAP](http://www.kidney.org/CAP)

of \$75,000 or more.<sup>2</sup> CKD patients are of varying socioeconomic status, with lower eGFR often corresponding to lower socioeconomic status.

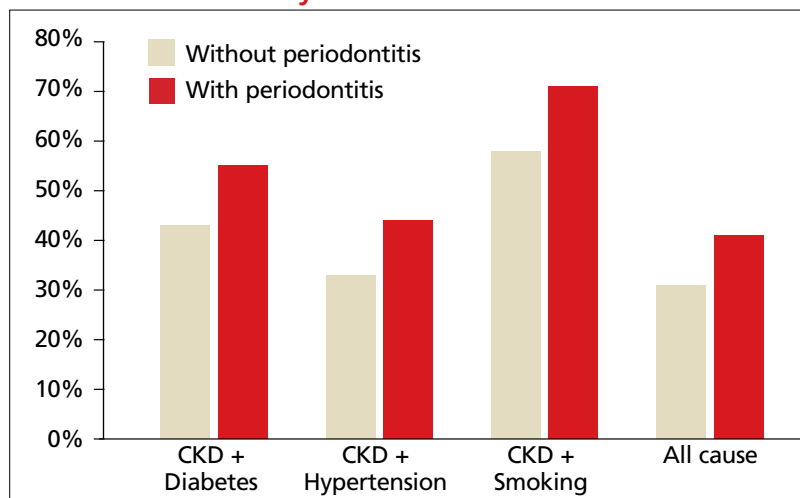
So while medical apps have a future with CKD (and by implication, all) patients, they are not unlike much else in medicine: We must tailor our practice to meet the needs of our patient population. These findings are encouraging for use of smartphone technology, but it is not a “one size fits all” solution. —SM

**Q** Someone at a conference I attended said kidney disease and bad teeth go hand in hand. Is this true? What does that mean for my patients?

“Bad teeth” can refer to periodontitis, a chronic inflamma-

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**FIGURE**  
**Incidence of Mortality With and Without Periodontitis**



tion of the tissue and structures around the teeth. The sixth most common disease in the world, periodontitis often leads to shrinkage of the gums, infection, and subsequent loosening or loss of teeth.<sup>3</sup>

Patients with chronic kidney disease (CKD) are predisposed to oral lesions and tooth decay related to dryness of the mouth; alterations in taste; malnutrition; and low albumin. Certain medications—such as  $\beta$ -blockers, diuretics, anticholinergics, anticonvulsants, and serotonin reuptake inhibitors—can increase the risk for dry mouth and negatively affect oral structures.<sup>4</sup>

Compared with community-dwelling adults, those with CKD have higher rates of periodontitis, which increase with disease progression.<sup>5</sup> A systematic review found that periodontitis increases the risk for CKD; evidence was inconclusive for the impact of periodontal treatment on estimated glomerular filtration rates (eGFR) but suggested positive improvements in eGFR.<sup>6</sup>

There is growing evidence of a multifaceted relationship between CKD, diabetes, periodontitis, and cardiovascular disease (CVD), the leading cause of mortality in patients with CKD.<sup>7</sup> Studies have shown that periodontitis can contribute to systemic inflammation, inhibiting glycemic control and elevating the risk for conditions such as CVD.<sup>8-10</sup>

Diabetes, the most common cause of CKD, is associated with adverse dental outcomes and poor glycemic control. Vice versa, severe periodontitis increases risk for diabetes and worsening glucose control. Mechanical periodontal treatment has been shown to improve glycemic control.<sup>8</sup>

A recent study showed an increased risk for both CVD events and all-cause mortality in those with stage III to stage V CKD (eGFR < 60 mL/min/1.73 m<sup>2</sup>). The study also found that periodontitis increased 10-year all-cause mortality in this population (see Figure).<sup>11</sup>

Research is ongoing regarding the complex relationship between CKD and oral health. For

patients with CKD at any stage, evidence promotes the benefits of good oral health habits. Encourage smoking cessation, daily flossing and tooth brushing, regular dental cleanings, and prompt evaluation and treatment of any oral issues.<sup>12</sup> —CS CR

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