



AUTHOR REPLY

We thank you for the positive comments regarding the findings of our study. Education to drink more, thirst, and memory are not enough to improve fluid intake for kidney stone prevention. New digital tools are needed to identify and initiate behavior change on a just-in-time basis when lapses in drinking behavior are detected. As you noted, it is also important for health behavior changes to be maintained. Incorporating patients in the design process should increase the value of new technology for them; this study offered a foundation for the field to consider as new technology for promoting fluid consumption is developed.

In addition to patient-specific feedback, opportunities exist to incorporate other contextual features (eg, location [work vs home]; day of week [weekend vs weekday]; time of day; environmental conditions [temperature]) and to personalize decision rules for selecting and timing notifications when lapses are detected.¹ A one-size-fits-all, universal solution may not exist, so technology should be (1) adaptable to accommodate the preferences and needs expressed by patients, and (2) adaptive in learning the idiosyncratic patterns and responses outside of patients' awareness. Such personalization will likely increase engagement and improve sustainable behavioral modification.

We agree that new technology might not be immediately suitable for all of today's patients; however, we note that technology adoption, particularly smartphones, continues to increase. Across all adults, smartphone ownership exceeds 80%.² Among adults age 65 years and older, smartphone ownership increased from 18% to 53% from 2013 to 2019. Developing and evaluating evidence-based digital tools takes considerable time. During that time, younger cohorts will join the ranks of older adults,

bringing their experience with technology into the older cohorts. Thus, the process of developing new health technology needs to begin today to be ready for the patients of tomorrow.

We agree with the point about limited generalizability and realize that responses about acceptability may not predict actual adoption and engagement across a more general population. In technology development it is common to have an early-stage design in small groups, which often limits diversity. However, the goal of this study was to open the door for patient input in the development process and we hope the field will remain open to input from more diverse populations as this work progresses. Ultimately, there can be no substitute for rigorous clinical trials with diverse patient populations to determine which digital tools are effective for stone prevention among different subpopulations of patients.

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<https://doi.org/10.1016/j.urology.2019.05.059>
UROLOGY 133: 66, 2019. © 2019 Elsevier Inc.