EDITORIAL

Information Technology in Primary Care Screenings: Ready for Prime Time?

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Health screenings for early detection and management of disease have been a major component of modern primary care since at least the early 1900s.[1] Early detection and intervention for acute and chronic conditions give patients a better chance of management and cure. In the current era of digitally informed work, it is only natural to expect the growth in the technological capabilities in health and medicine to also advance and support disease screening. This editorial examines 4 papers on using digital health tools in primary care screening initiatives. These studies illustrate valuable concepts to consider as we imagine a future where technology is an even more integral part of how we screen for disease and deliver care.

El Mouahidine and colleagues performed a prospective observational trial in small private primary care clinics in France to assess the feasibility and acceptance of a patient-administered hearing screening test.[2] This test was performed on consumer-grade hand-held tablets and Bluetooth headphones at the point of care. On average, it took 6 minutes for consent, instruction, and completion of the testing, which is not an insignificant time investment in typically compressed primary care visits. Of 516 patients eligible for screening, 219 (42%) were able to complete the testing. Of those screened, 59 (27%) screened positive for some hearing impairment and were subsequently referred to an ENT specialist. Only 16 patients ultimately followed up, however, 14 of which had ENT-confirmed hearing loss.

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Kinaszczuk and colleagues present the findings of a pilot cross-sectional study investigating artificial intelligence's (AI's) role in preconception cardiomyopathy screenings among women of childbearing age at an academic medical center in Florida.[3] They compared the use of an AI algorithm fed by digital stethoscope recordings and single-lead ECG with a cohort of 100 patients scheduled to undergo an echocardiogram (Cohort I) to 100 patients at the point of care (Cohort II) to identify preconception cardiomyopathy. All patients underwent echocardiography. Statistical analysis showed both cohorts with acceptable negative predictive value. Cohort II did have a higher false positive rate of 17% vs Cohort I 4%. Study authors found these AI tools to be effective for the detection of cardiomyopathy associated with left ventricular systolic dysfunction among women of reproductive age and concluded that the tools could potentially be useful for preconception cardiovascular evaluations.

Finally, 2 related studies explore the implementation of a digital screening tool for dementia in primary care settings in Indiana.[4,5] Fowler and colleagues share the findings of a large-scale implementation of a digital cognitive assessment (DCA) tool for screening of Alzheimer disease and related dementias (ADRD) among 7 high-volume and diverse clinics in Indiana.[6] The intervention also used a tablet-based tool for self-administration at some point during a primary care visit. Of the 16,708 patients/encounters who were identified as eligible for screening, 1,808 (10.8%) were successfully evaluated. Of those, 13.7% showed some signs of cognitive impairment and were referred for follow-up testing. A key element of their intervention was the inclusion of a brain health navigator (BHN) who provided essential support to patients with positive screenings and assisted the clinicians with follow-up assessments. This group also further analyzed their work and looked specifically at how agile implementation methods supported their work.[4] Their conclusions pointed to the importance of having flexibility in implementation details across sites. Maintaining clinician engagement would not have been possible throughout the study without

the ability to be tailored to each clinical setting. There was also a significant increase in screening rate throughout the implementation which speaks to the need to be adaptable to unforeseen barriers.

These studies highlight the importance of centering any digital health intervention on the patients and their specific clinical needs. It is exciting to be in medicine at a time of new start-ups that tout the ability to solve the problems of primary care through magical-sounding tools, such as agentic artificial intelligence and multimodal language models, however, with varied capabilities of artificial intelligence, technology in medicine can turn into a solution in search of a problem. Primary care needs to create focused solutions that address the needs of the patients while supporting the clinical teams who have been doing this work for decades.[6] In a time where news headlines tout the inevitability of algorithms replacing clinicians, the reality demonstrated by these examples indicates that digital tools work best when they augment rather than replace clinicians. This is a compelling argument when considering the finite time and spaces typically used in screenings in primary care. Carefully applied technology can improve our ability to appropriately intervene for positive screenings, especially when there are confirmatory and definitive interventions that can be costly for patients and health delivery systems in terms of time, financial resources, and human capital. Even purposeful technology implementations, however, may not provide the desired outcome in all clinical settings.

There are some cautionary nuggets in the example cases. Specifically, how technology is implemented can be just as important as what technology is. Leaning on sound implementation science is key. Engaging stakeholders, dedicating resources, and educating clinicians and patients are all vital to realizing the benefit of any new tool in the clinical workflow. However, even with significant resources dedicated to implementation, novel digital tools will not replace well-worn workflows overnight. In addition to technical hurdles and practical workflow barriers, we do not have a population (in clinicians or patients) that has so far demonstrated 100% acceptance of technology, especially in unfamiliar forms. And even if there is engagement, familiarity, and acceptance, the realities of primary care practice with competing demands show us that often, there is no time to perform the novel tablet-based AI screening.

But what if everything does go well and the new digital tool is perfectly streamlined, accepted, and used flawlessly? Even if screenings reveal abnormal findings, if other barriers, for example, the lack of team members to ensure coordination and integration of care—a cornerstone of patient-centered care—prevent patients from follow-up, including additional testing or specialist care, the needle has not actually moved. Institutional readiness and patients' culture, health beliefs, and health literacy cannot be overlooked. More screening may result in more findings. This may reveal the need for more nurses, patient navigators, social workers, access to specialists, etc. We cannot forget the human element while integrating digital tools into clinical practice.

We can and should look for ways to incorporate the new digital health tools to screen our patients in the myriad of ways that we now can, but we must remember to design good workflows that consider the whole patient and what will happen next. AI has the potential to boost the Quintuple Aims of improved patient experience, better outcomes, lower cost, clinician well-being, and health equity.[7] It is up to us to ensure that happens.

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