Harvard Med Apps Use Genomic, Clinical Data to Assess Diabetes Risk; Improve Treatment Compliance

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Premium

This week, researchers at Harvard Medical School's Biomedical Cybernetics Laboratory released two free iPad applications, available on iTunes, intended to help clinicians assess diabetes risk and improve treatment compliance in patients with the disease.

Gil Alterovitz, an assistant professor at Harvard Medical School and the HMS Center for Biomedical Informatics, told BioInform that he and colleagues developed the apps to provide a standardized method of communicating clinical and genetic information to physicians, caregivers, and patients .

The first app, Genomics Advisor, combines results from direct-to-consumer genetic tests such as 23andMe with clinical information enabling physicians to assess patients' risk profile for diabetes, the risk for related co-morbidities such as cardiovascular disease and hypertension, and gene-drug interactions.

The second app, DB Bear EMR, is intended to improve treatment compliance among diabetic patients. The app includes a Genomics Advisor module which provides some diabetes-related genomic and clinical information, and is integrated with external technologies such as a teddy bear avatar designed by Sproutel — a company that makes interactive games to help children with chronic illness understand and manage their health — and a web-enabled Telcare glucose meter.

Underlying both apps is infrastructure from HMS' Substitutable Medical Apps and Reusable Technologies, or SMART, program, which lets developers build applications that can work on a variety of different genomic and clinical databases without needing to be adapted for each one. Its features include lightweight medical data model, standards-based clinical vocabularies, and an application programming interface called the SMART Genomics API through which it accesses clinical information stored in hospitals' electronic health records, personal health records stored in resources such as Microsoft HealthVault, and genetic information from DTC tests, Alterovitz said.

The API also enables the DB Bear EMR app to collect glucose measurements collected and stored by the Telcare glucose meter — a device that tests glucose blood levels and uploads them to a HIPAA-compliant cloud-based server. Based on the measured glucose levels, the teddy bear avatar is either happy or sad, Alterovitz said. This should hopefully help children be more mindful of their health and more willing to adhere to physicians' instructions, and also highlights the importance of checking their glucose levels regularly, he said. Sproutel also sells an

actual teddy bear equipped with a backpack that can be used to hold the Telcare device providing children with a physical reminder to measure their glucose levels.

The HMS researchers plan to develop additional apps but Alterovitz could not disclose details about what those apps will be. They will also update the Genomics Advisor app to include other diseases that have co-morbidities, he said. This way, "we would have clusters of diseases that we would look at … rather than look at every single disease … that may be a bit too much to process all at once."

There are also plans to release versions of Genomics Advisor and DB Bear EMR for other mobile devices. So far the researchers have created versions for Android and Windows, but haven't yet launched them and don't have a specific release date, he said.

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