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Democratizing Data

New apps put the power of data in the hands of physicians and even the youngest patients

By JAKE MILLER
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Kid-friendly interfaces help make medical data more accessible to young patients. Image: Gil Alterovitz.

The complex interplay between a patient's genetic makeup and current clinical profile can provide important clues about the best way to treat and prevent disease—but only if that data is accessible and intelligible to the people who need to act on it.

Researchers at Harvard Medical School's Biomedical Cybernetics Laboratory have developed several apps that integrate data from a variety of sources in order to provide a more holistic view of current and future health. Two of the apps, Genomics Advisor and DB EMR will be released on iTunes on Aug. 7, 2013.

As a result, consumers will have access to a powerful new ecosystem of tools that can provide crucial insight into genetic risks, clues about drug susceptibility and feedback on current treatment programs—in real-time. The apps are built on a flexible framework that allows developers to customize the user experience and data flow as needed.

Managing diabetes with innovation

"When a patient sees information about her blood sugar levels in an app on her mobile device, it is going to look very different from what a clinician, a hospital administrator, or a researcher would see," said Gil Alterovitz, an assistant professor at Harvard Medical School and at the HMS Center for Biomedical Informatics.

Genomics Advisor integrates clinical and genomic information for the consumer, Alterovitz said. Developed for the iPad, the app allows physicians and patients to view genomic information from consumer genetic tests such as 23andMe, along with an analysis that relates the genetic data to relative disease risks and clinical information. Genomics Advisor, in this initial release, will focus on

diabetes and related illnesses. Patients can bring their iPads to the doctor and review the information.

DB Bear EMR, another iPad mobile medical app, seeks to improve treatment compliance among diabetic patients while providing data to clinicians. The app is integrated with several existing technologies, including a teddy bear designed by Sproutel Inc., and a web-enabled Telecare glucose meter.

The integration with the teddy bear is designed to help young children begin to understand and manage their health. The iPad app, which communicates with the bear, provides extensive and detailed live data for clinicians and patients to view, and uses interactive bear animations to share information with the young patients.

“Ultimately, we hope these features increase treatment compliance with patients,” Alterovitz said.

Integrating health data into real life

Underlying these developments is a flexible, standards-based medical data model known as SMART, (Substitutable Medical Apps and Reusable Technologies) a program that allows developers to create applications that can work on a variety of different genomic and clinical databases without needing to be adapted for each one.

“You don’t need to build a new car every time you want to drive on a new road,” said Alterovitz. “Standardized data structures and application program interfaces (APIs) mean you can explore new routes without reinventing the wheel.” It also means that developers can design apps quickly—in this case through collaboration with students Yao Chen and Yang Xin at the South University of Science and Technology of China.

As a part of standards development, Alterovitz and his team have implemented the SMART Genomics API. This API, which allows for sharing and integrating genetic information with clinical EMR (Electronic Medical Record) data, is now being integrated into the HL7 international standards organization’s FHIR (Fast Healthcare Interoperability Resources) and implemented in medical settings. Alterovitz is hosting an HL7-based session on Sept. 27, to further standards development at the Center for Biomedical Informatics at HMS.

“With standards in place, it is easier for app developers to access and integrate data from diverse sources using customizable interface built to suit the needs of different users and different tasks,” Alterovitz said.

“We are excited to be exploring new ways to use the power of data to help patients and physicians work together toward better medical outcomes,” he said.

For more information, the SMART Genomics group can be reached at: genomics@smartplatforms.org

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