

iHeal: A mobile device for preventing and treating drug use

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Imagine a device combining sensors to measure physiological changes. Then imagine a smartphone with software applications designed to respond to your bodily changes in an attempt to change your behavior. That is the vision behind "iHeal," currently being developed by Edward Boyer from the University of Massachusetts Medical School in the US, and his colleagues. The multimedia device is an innovative combination of 'enabling technologies' which can detect developing drug cravings and intervene as the cravings develop to prevent drug use. Boyer and team's preliminary data and key findings to date are published online in Springer's *Journal of Medical Toxicology*.

So called 'enabling technologies' - artificial intelligence, continuous physiological monitoring, [wireless connectivity](#), and smartphone computation - exist to make [behavioral interventions](#) more effective outside the clinic or office environments. In everyday, [natural environments](#), they can detect changes in an individual's biological and affective states, which could well be trigger points for risky [health behaviors](#), such as substance use.

iHeal is different from existing mobile health applications, because it incorporates biosensors. Individuals with a history of substance abuse and post-traumatic stress disorder wear a sensor band around their wrist that measures the electrical activity of the skin, body motion, skin temperature and heart rate - all indicators of arousal or stress. The band wirelessly transmits information to a smartphone, where software applications monitor and process the user's [physiological data](#).

When the software detects an increased stress or arousal level, it asks the user to annotate events by inputting information about their perceived level of stress, drug cravings, and current activities. iHeal's ultimate goal is to identify, in real-time, drug cravings and deliver personalized, multimedia drug [prevention interventions](#) precisely at the moment of greatest need.

Boyer and team's paper examines iHeal's development process to date i.e. system architecture, as well as preliminary feedback from potential users to identify potential limitations and key attributes from a user-perspective. Their analyses suggest a number of technical issues related to data security, as well as the need for a more robust and less stigmatizing version before the device could be worn in public. This could be a sensor band that has the appearance and functionality of a wrist-watch, or a sensor that can be worn on the ankle.

The authors conclude: "Our findings demonstrate that conducting clinical trials using enabling technologies in natural environments will require a deeper understanding of user preferences. Study designers should rely on recipients rather than 'experts' to create intervention content. A focus on preventing identification of research participants to avoid subsequent stigmatization is also key."

More information: Boyer EW et al (2012). Preliminary efforts directed toward the detection of craving of illicit substances: the iHeal Project. *Journal of Medical Toxicology*.

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